

# JOURNAL of the American Veterinary Medical Association

FORMERLY

AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Assn.)

EDITED AND PUBLISHED FOR

The American Veterinary Medical Association

## CONTENTS

Editorial .....	399
Papers:	
Genital Infections in the Bull—Herbert L. Gilman.....	416
Importance of Preventive Measures in Repressing Animal Diseases— T. E. Munce .....	402
Some Studies in Swine Abortion—Fred Hayes.....	435
The Occurrence of Virulent and Nonvirulent Strains of the Hemor- rhagic Septicemia Organism in the Same Animal—H. Preston Hoskins .....	453
Clinical and Case Reports:	
Pathogenic Effects of Capillaria Worms on Chickens—E. L. Stubbs and Howard Crawley .....	461
Abstracts .....	463
Army Veterinary Service:	
The Percheron as an Army Horse.....	467
Association News:	
Proceedings of the Fifty-eighth Annual Meeting, A. V. M. A.....	470
Executive Board Meeting and Other A. V. M. A. Notes.....	508
Other Meetings .....	510
Communications:	
Invitation to Cuban Medical Congress.....	527
Boost Purebred Stock and Use the Horse.....	528
Necrology .....	530
Miscellaneous:	
Farm Horses Raise Cash .....	534

THE JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION is issued the first of each month. Manuscripts and copy for insertion should be as nearly perfect as possible for the printer and should be received by the tenth of the preceding month to insure insertion in the next month's issue. Volumes begin in April and October.

Communications relating to publication, subscription, advertisements and remittances should be addressed to JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, 1620 Hobart Street, Washington, D. C. Matters pertaining to the American Veterinary Medical Association and membership should be sent to Dr. N. S. Mayo, Secretary, 4758 Ravenswood Avenue, Chicago, Illinois.

\$4.00 per annum

Foreign \$5.00; Canada \$4.25

Single Copies 46 cts. in U. S.



**Our Best Wishes**  
**to you for**  
**A Happy New Year!**

*Sincerely yours,*

**ZELL-STRAUB LABORATORIES, Inc.**

Masonic Temple

Chicago, Ill.

C. A. Zell, D. V. M., President; A. A. Leibold, D. V. M., Vice President  
W. F. Straub, B. Sc., Secretary-Treasurer

Producers of Veterinary Biologics

**CAMPHOSOL      HEMOGEN      FLAVISOL**

*Our Laboratories and Distributors of Z-S Products are at your  
service to help make 1922 a more prosperous year for you.*

Distributors:

GRAIN BELT SUPPLY Co.,  
Omaha, Neb.; Mason City, Ia.

OTTUMWA SERUM Co.,  
Indianapolis, Ind.

GREGORY FARM LABORATORY,  
White Hall, Ill.

SOUTHEASTERN LABORATORIES,  
Atlanta, Ga.

DR. J. S. KOEN,  
Bloomington, Ill.

GREAT WESTERN SERUM Co.,  
Chicago, Ill.

SHARP & SMITH,  
Chicago, Ill.

CEDAR RAPIDS SERUM Co.,  
Cedar Rapids, Ia.

CORN BELT SERUM Co.,  
East St. Louis, Ill.

DANVILLE WHOLESALE DRUG Co.,  
Danville, Ill.

HOCK VETERINARY SUPPLY Co.,  
Jackson, Miss.







# **JOURNAL**

## **OF THE**

### **American Veterinary Medical Association**

**FORMERLY AMERICAN VETERINARY REVIEW**

(Original Official Organ U. S. Vet. Med. Ass'n.)

J. R. MOHLER, Editor, Washington, D. C.

---

A. T. KINSLEY, President, Kansas City, Mo.      N. S. MAYO, Secretary, Chicago, Ill.  
M. JACOB, Treasurer, Knoxville, Tenn.

**Executive Board**

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; S. E. BENNETT, 3rd District;  
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; R. A.  
ARCHIBALD, 6th District; CASSIUS WAY, Member at Large

**Sub-Committee on Journal**

S. E. BENNETT      J. A. KIERNAN

---

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. Prices will be sent upon application.

---

VOL. LX, N. S. VOL. 13

JANUARY, 1922

No. 4

---

## **THE OLD YEAR AND THE NEW**

THE YEAR just closed leaves as a legacy more of promise than of actual realization. The recovery from the post-war depression is slow, very slow. It has taken a long time to "turn the corner." In fact, the turn in the road has been a wide bend with a scarcely perceptible curve, rather than a corner. But the turn has unmistakably come at last, and for this we have reason to be thankful.

Conditions are clearly better in every respect than they were a year ago. Agriculture, upon which the prosperity of the veterinary profession depends, finds itself in a much more fortunate situation than for some time past. World affairs are in a fair way to be adjusted and put upon a better basis for recovery and commercial revival. There is a better feeling in the air. The prognosis is undoubtedly favorable.

The treatment required is less heat and more light; less gloom and more sunshine; less circumvention and more courage; less prattle and more patriotism.

In extending to all its readers the greetings of the holiday season and best wishes for happiness and prosperity in the New Year, THE JOURNAL feels that these wishes have a real prospect of fulfilment.



### OPPORTUNITIES FOR VETERINARIANS

SUCCESS in veterinary practice depends not only on professional skill but also on many personal qualities and a liberal amount of general knowledge. To a large extent the welfare of the nation's ten-billion-dollar livestock industry depends on keeping our domestic stock healthy and in good condition for breeding or for marketing. Frequently the veterinarian stands between profit and loss on a livestock owner's books. Less often but on important occasions, the skill of the veterinarian—like that of a fireman—may check a destructive outbreak which threatens a community.

Such responsibilities call for a high degree of judgment, competence, and manhood. The technical training can be obtained in the many excellent colleges which give veterinary instruction, but the other qualities are developed most fully by individual resourcefulness. The various veterinary services of the Government desire veterinarians to understand fully the different lines of official work, including the importance, method, and organization of such work. Veterinary practice, in most cases, is a local field. On the other hand, problems affecting the health and welfare of the various classes of livestock are matters of national and, frequently, international importance. We wish all veterinarians would look at it in that light. We hope also that everyone engaged in the veterinary profession will consider his field as including more than technical practice. Successful veterinarians recognize that a general knowledge of feeding, breeding, housing, and care of livestock puts them in a position to win the confidence of the owner. A veterinarian who is abreast of the times in those things necessarily radiates his ability of dealing in a competent manner with the problems coming more directly within the scope of veterinary practice.

Briefly the veterinary profession is an important, a useful, and a necessary part of the present great and the future greater livestock industry. It needs men who are well trained, open minded, and of broad interests and sympathies. It is sometimes claimed that livestock receive greater attention than human beings. If such is the case, the human race should receive more expert study rather than livestock any less. The reason is plain. Through many centuries the welfare of nations has depended in a large degree on the food, clothing, labor, and count-

less by-products which livestock have furnished. The person therefore who aids in improving, enlarging, and safeguarding the domestic animals of a nation is spending his life usefully and well.

---

### THE VETERINARY JOURNAL

IT is a pity that, generally speaking, each nation is inclined to consider its own discoveries and progress sufficient for its every day needs, and yet, as far as science is concerned, such an attitude is indefensible. We are prompted to make this remark by the receipt and perusal of a recent copy of the *Veterinary Journal*. Here we have a periodical representative of the British veterinary profession, containing the results of their research, the expression of their views on matters of universal interest, clinical notes, etc.; in short, an epitome of all that is occurring in the progress of British veterinary science. But how many of us could say that they ever read the *Veterinary Journal*, or at any rate see it regularly? Few of us could make such a claim. In other words, we admit that we live in a water-tight compartment and are content to do so. This is not wise; it is hardly polite even and certainly not politic to continue living in happy ignorance of our fellow-workers across the sea. At any rate, it is certainly a state of affairs which is up to each individual veterinarian to remedy.

---

### ADDITIONAL FUNDS FOR TUBERCULOSIS WORK

PRESIDENT HARDING on December 15, 1921, signed the General Deficiency Bill which included an emergency item of \$600,000 as a supplemental indemnity fund for tuberculosis work. Restrictions are carried in the item so that none of the money can be spent on cattle which have not been in the possession of their owners for at least six months, and further, the money can not be used in paying for reacting cattle in herds which heretofore have not been placed under supervision, unless such herds are in so-called circumscribed areas from which the co-operative authorities propose to eradicate tuberculosis from all the cattle therein, under the accredited area plan of operation. The recommendation of the Secretary of Agriculture was for an indemnity appropriation of \$900,000, so it can be easily calculated that the amount carried in the recent bill will go only two-thirds of the distance the original amount was intended to cover.

## IMPORTANCE OF PREVENTIVE MEASURES IN RE-PRESSING ANIMAL DISEASES<sup>1</sup>

By T. E. MUNCE

*State Veterinarian, Harrisburg, Pa.*

THIS PAPER is a contribution from the Bureau of Animal Industry, Pennsylvania Department of Agriculture, for which the writer is merely the mouthpiece, and in the beginning desires to express his appreciation to our field, laboratory and office forces, also to our cooperating veterinarians and breeders who have been consulted and have offered suggestions. It deals with disease prevention, and therefore with health, which is a condition of physical soundness or well-being.

Health requires a study of hygiene, the aim of which is to render growth nearer perfect, decay less rapid, life more vigorous and death more remote. Hygiene embraces acquaintance with such subjects as physics, engineering, architecture, chemistry, epidemiology, bacteriology, parasitology, statistics, conditions of food, water, shelter and surroundings, the climate, nature of the soil and a knowledge of practicable methods that may be used in preventing disease. Each phase of these subjects that may have any bearing upon the health of animals and man must be considered, and thus it involves our subject, "Disease Prevention," for these things which tend to preserve health will prevent disease.

Much has been written about and considerable done in disease prevention—so much, in fact, that it is lost in volumes of literature available to those who have time to peruse its pages. "To see clearly what has been done, and why, is to see, at least vaguely, what will be done, and when."

We have nothing new or unusual to offer. Our purpose is to stimulate a deeper, keener interest than now prevails, and to point out the possibilities to the many individuals who are in position to give advice on prevention, which is the key to the control of each and every transmissible disease.

Measures for disease prevention were practiced before the time of Christ, even before the causes had been discovered and before the diseases we know today had been designated under

<sup>1</sup> Presented at the fifty-eighth annual meeting of the American Veterinary Medical Association, Denver, Colo., September 5-9, 1921.



their present names. Since times before Christ disease prevention has been a progressive science. During the present age it is terribly neglected.

Biological products, intended to prevent, are supplanting actual prevention. Veterinarians and stockmen are too eager to have a biological product for use in this or that disease and are inclined to say, "We did all that could be done; the biologic is at fault." Many biological products have their places and should not be belittled. We need their assistance as diagnostic and preventive agents. Some of them have no value and it is unfortunate that they are used. All vaccines are the same to many stockmen; and thus, when improperly advised by his veterinarian to use them, it is not the stockman nor the vaccine that is at fault. The veterinarian must assume full responsibility for having given such improper advice.

The prevention of the appearance and spread of transmissible diseases is within the grasp of the owner of livestock, and it is through his ingenuity in the employment of the necessary agencies that the results for which he hopes can be attained. When that is universally realized, greater strides than ever before known will have been made. The owner who devotes his efforts to preventing disease will use less in fighting it, and greater will be the outcome of his livestock industry and larger his income. All classes of owners employ veterinarians, but it is he who employs a veterinarian as one of his agencies in the prevention of disease that becomes the most satisfactory client and receives the largest return for money expended.

One prominent State official has said that the most important factors in dealing with a disease are the central office and the field personnel. We believe the greatest factor in the prevention and control of all animal diseases is the attitude of the livestock owners and the consuming public. If producers and consumers of animal products are not favorable to the repression of animal diseases, our work is hopelessly handicapped. On the other hand, if they recognize the economic feature, and the danger to public health caused by prevalent preventable animal diseases, and unite in an effort to suppress such diseases, there is only one power that may stop an early and complete consummation of the task that we, as regulatory officials, are attempting. We repeat, the producer and the consumer are the greatest factors

in this work. Hence it is our immediate duty to arouse these factors to action. Agricultural editors recognize this truth. In this connection we quote, in part, from farm paper editorials:

*Breeders' Gazette*: "Malnutrition and disease are the chief causes of inefficiency in farm animals. Contaminated water, insanitary buildings, poor pastures and inferior grades of feed are the enemies of thrift, health and usefulness in stock. Breeding for efficiency is futile if it is not supplemented by feeding, watering and managing for efficiency."

A. J. Glover, Editor of *Hoard's Dairyman*, at the meeting of the United States Live Stock Sanitary Association a year ago, said: "We are trending too much in this Association to veterinary subjects, and not enough to sanitary subjects and subjects that have to do with keeping animals healthy and physically strong."

E. S. Bayard in an editorial in the *National Stockman and Farmer* said that "while it is impossible to overestimate the value of the work of the veterinary profession in preventing, controlling and eradicating diseases of domestic animals, eradication and control have been given most attention. But it is time to consider seriously whether prevention may not be possible to a greater extent than we have supposed. It will be cheaper to keep disease out of territories now free than to put it out later. The American Veterinary Medical Association and the United States Live Stock Sanitary Association at their next annual meetings in September and December, respectively, should consider this problem along with others relating to prevention and should appoint men to confer with dairymen and the various organizations interested in livestock."

Assistant Surgeon General W. T. Sedgwick of the United States Public Health Service published in the *Medical Record* a recommendation that the present curriculums of the medical schools be evenly divided and that one division be devoted to preventive medicine, giving a degree of Doctor of Health, this branch to include those studies relating to sanitary science, vital statistics, laboratory methods, municipal sanitation, preventive hygiene and correlated subjects. General Sedgwick clearly shows the necessity for such specially trained personnel in the health services of the various States and the nation, and the difficulties experienced by these governmental departments in securing the services of persons especially fitted for the work of disease pre-

vention. Our veterinary schools may be profited by giving thought to the General's suggestion.

The general principles of disease prevention can be applied to all classes of diseases. It is possible to prevent disease without knowing the cause; but to prevent disease intelligently and successfully, one must have knowledge of the nature of the disease, its causes and the nature of its cause, its modes of transmission and dissemination, its symptomatology and epidemiology, postmortem lesions, and animals that are susceptible.

In considering the nature of diseases, some are acute and epizootic, while others are chronic and spread over the entire year; others are more likely to occur during one season than another; some are dependent upon an intermediate host for transmission (Texas fever). Such diseases as tuberculosis, bovine infectious abortion (cows calving during every season of the year), actinomycosis and glanders are spread over the entire year; infected and susceptible animals are always present and repression is more difficult.

To understand the nature of the cause of a disease is to understand the best methods of preventing its spread. Knowing that certain spore-forming organisms, such as those causing anthrax, blackleg and malignant edema, tetanus and botulism, exist in the soil, the nature and location of the soil must be taken into consideration. Some organisms are capable of forming a wax, as the tubercle bacillus. Others form capsules. Having knowledge of these phenomena of transmissible diseases, one is in a better position to devise effective methods for destruction. It naturally follows that some organisms are less resistant to drying and exposure to sunlight than others; some require vigorous disinfection and fumigation to make sure of their destruction.

Having made a study of the nature of disease-producing organisms, and knowing the periods of incubation, it has been made more easily possible to formulate the proper quarantine regulations. More than one of our good stockmen have said that the greatest weakness in our accredited-herd plan is the short time that additions to herds are required to be isolated before they are permitted to enter the herd. It does not seem plausible that, if it requires two clean annual tests to accredit a herd, only sixty days' isolation is necessary to accredit individual added animals, regardless of their source.

The modes of transmission and dissemination of disease-pro-



ducing organisms are peculiarly different for almost every disease. The transmission of rabies requires the bite of the rabid dog, and to prevent its spread you quarantine or destroy the dog. To prevent the spread of southern cattle fever you destroy the tick or the intermediate host containing the cause. In scabies the mite, which is the cause, is destroyed. In other diseases methods of preventive vaccination are used. In still others a combination of methods is required, such as quarantine, vaccination, slaughter of affected animals and proper disinfection. In most diseases dissemination is dependent upon the movement and introduction of animals susceptible to the disease under question. However, we believe it is too often overlooked that other species and agencies as well as persons may be the means of dissemination or the source of infection. In this class can be mentioned dogs, cats, rats, mice, poultry, birds, insects, feed, feed sacks, crates, persons who travel from place to place, etc.

Recently an instance illustrative of this danger was brought to our attention. A cat, which had been sick for about a year, on autopsy revealed generalized tuberculosis. All of the discharges were examined and found to contain large numbers of tubercle bacilli. It is not unusual for cats to sleep or lie in feed bins, mangers and mows, and it will readily be seen how the cat just described may have spread the disease.

Dr. Schroeder of the United States Bureau of Animal Industry at a recent tuberculosis conference pointed out the danger from mice as spreaders of tubercle bacilli and especially emphasized the contamination of feed with their feces and by their death in feed bins. Conditions similar to these may account for the occurrence of tuberculosis in herds where the source of infection seemingly can not be ascertained. These small animals may be a greater factor than is generally supposed in the spread of other diseases.

Horses are generally regarded as the least susceptible of the domestic animals to tuberculosis, yet recently our attention has been called to three well-developed cases, and in each case the horse was stabled in close contact with cattle, several of which were tuberculous. Postmortems of these horses showed open, generalized tuberculosis.

In the foregoing instances tuberculin testing of the cows, dis-

posing of the reactors and cleaning and disinfecting the barns would not have eradicated the disease from the premises.

Federal, State, municipal and practicing veterinarians traveling from one place to another should be particularly careful that they may not be accused of transmitting disease. During the 1914-15 outbreak of apthous fever careless veterinarians carried the disease from one place to another.

Stable construction and herd management are among the chief influences governing the spread of all transmissible diseases. Pearson said: "Any system of stable management that serves to bring diseased and healthy animals into intimate contact, that facilitates the deposit of tubercle bacilli within the reach of healthy cattle, that serves to favor the accumulation or the distribution of germs of tuberculosis, or to prolong their life in the stable, helps to cause infection. And, further, any system of herd management that tends to reduce the vital resistance of the animal by overwork or improper nourishment, or to depress the activity of the organs or functions by insufficient use, will favor the spread of tuberculosis by preparing the soil upon which the seed is sown."

Safeguarding the young stock is one of the most important features in disease prevention. Intelligent selection, mating and care of parent stock and management of the young are fundamental to the prevention of disease. Intelligence in selection of parent stock will determine to a large degree, in advance, the percentage of runts and faults of conformation which inhibit rapid growth and development. It has been proved that sunlight, fresh air, suitable food and good water put vim, vigor and vitality into growing young stock, thus insuring well-developed mature animals which can best resist disease.

Roosevelt said: "If you are going to do anything permanent for the average man, you must begin before he is a man. The chance of success lies in working with the boy and not the man." His statement can be applied, with equal force and effect, to the animal kingdom.

The environment and surrounding conditions, which include the owner, his family, his assistants and employees, the premises, their location and equipment, breeding, care, feed, water and sanitation, are factors that too frequently are not given the high rank they deserve.

A healthy animal, even though housed in an insanitary place,

will not contract disease until exposed to infection. This suggests the question, How are we to determine the presence or absence of infection on premises? Disease-producing germs thrive best in dirty, dark, damp places. It follows, then, that germs will thrive best and remain longest where the accommodations are favorable.

Practically all State and Federal laws which create departments of agriculture and bureaus of animal industry or livestock sanitary boards prescribe that they shall prevent, suppress, control and eradicate dangerous transmissible diseases of animals. What attention are the regulatory authorities giving to preventive measures? Are we giving equal attention to disease prevention as to control? Do the bulletins that are published contain as much information and place equal emphasis on disease prevention as matter of control? Do the journals, agricultural and daily papers, contain information pertaining to disease prevention? Do we hear from the public platform and in private conversation about the things that have to do with disease prevention?

On numerous occasions veterinarians have taken issue with health board authorities as to proper measures for safeguarding the milk supply. In the instances referred to the health officials recommended laboratory examination of the milk at destination as being sufficient protection to the consuming public. The veterinarians took the position that the principal inspection should be made at the seat of production on the farm.

In order to protect a stream of water from contamination we not only go to its source and inspect the water, but surround the very fountain springs and watersheds with safeguards to make contamination impossible. Is this not truly prevention, and are we veterinarians consistent when we advocate prevention as the outstanding principle in the case of a water or milk supply and practice the opposite theory when dealing with animal diseases?

In Pennsylvania we have a disease-prevention service in which our bureau cooperates with the leading stockmen and breeders' associations and clubs, realizing that their support is indispensable. We have a veterinarian specializing in disease-prevention work. His duties are to study the subject of disease prevention and formulate plans for preventing the occurrence of disease. This agent operates with the owner, the person in charge of the livestock involved, the attending veterinarian, the county agent



and the Federal and State district agents. A careful survey is made of all livestock on the premises, the buildings and their location, methods and practices for breeding, additions, feeding, watering and management. A full report with recommendations is sent to the central office and copies are distributed to the owner, local veterinarian, county agent and district, Federal or State and municipal inspectors. (The form used for this report is shown herewith.) In this way every cooperating agency knows of the defects and the recommendations and are in position to work as a unit in bringing about improvement. Too often work of this character is handicapped by lack of cooperation and through conflicting instructions. This special agent's work is supplemented by the regular field and laboratory force.

[Form used in reporting on inspection of premises.]

PENNSYLVANIA DEPARTMENT OF AGRICULTURE

BUREAU OF ANIMAL INDUSTRY

#### PREMISE REPORT

Completed examination and tuberculin test on herd owned by Mr. \_\_\_\_\_, P. O. \_\_\_\_\_, \_\_\_\_\_ County, with result that of \_\_\_\_\_ tested \_\_\_\_\_ reacted \_\_\_\_\_ suspicious.

If reactors were found, what instructions were given regarding cleaning of premises \_\_\_\_\_

General plan of stable (character and condition) \_\_\_\_\_

Method of ventilating \_\_\_\_\_

Floor \_\_\_\_\_ Gutters \_\_\_\_\_

Describe drainage \_\_\_\_\_

Condition of yards \_\_\_\_\_

Care and housing of calves \_\_\_\_\_

I offered the following suggestion as to permanent improvements, arrangements of buildings and care of the herd: \_\_\_\_\_

Mr. \_\_\_\_\_ will make the following improvements or changes in the order enumerated below: \_\_\_\_\_

Date \_\_\_\_\_ 19 \_\_\_\_\_

Agent.

(For remarks use other side)

In regard to hog cholera, more attention has been given to its control, through the use of serum and virus, than to its prevention. The swine owners of the country have been led to believe that liberal use of anti-hog-cholera serum and hog-cholera virus is all that is necessary for hog cholera prevention.

Until matters that have to do with prevention are recognized as being of major importance, we can not hope to make satisfactory progress in permanently eradicating any disease.

Destroy the breeding places of flies and mosquitoes and those pests will become extinct.

Afford protection to herds and flocks that are now free from disease and there will be no disease to eradicate.

Instead of giving a list of conclusions we will give a few practical examples of disease prevention as they are being practiced in Pennsylvania today. I wish to say first in this connection that it is possible, and we believe practicable, to prevent every disease of a transmissible character in animals.

Many years ago in one of our large cities, when street cars were drawn by horses, one of our veterinarians was called to give advice on the treatment of sore shoulders which were causing disability in more than 50 per cent of the horses. He not only advised but insisted that the collars and hames be properly fitted, the manes kept smooth and the shoulders clean. His advice was followed, with excellent results, the percentage of sore shoulders being reduced to less than 10 per cent.

One of our leading breeders started with twelve head of cattle, and from this foundation, with proper veterinary advice, has built up a large herd. He adopted the motto, "A cow that leaves the farm must not return." During the ten years of his breeding experience there has not been a case of infectious disease in his herd. That was prevention. The same methods have been successful in other herds of more recent origin.

Another breeder went along for a period of ten years, building up a splendid Guernsey herd without the appearance of any infectious disease. He then sought new blood, without proper advice, and unknowingly introduced abortion to his premises. Three months later the disease was recognized. The newly acquired cattle were isolated and the premises thoroughly disinfected. The abortions ceased and there has been no return up to this time.

Another herd of over 150 head of cattle may be cited, in which nearly one year ago abortion was in progress. Up to that time six or seven cows had aborted. Preventive measures were enforced, and in addition to those that had aborted eight other cows were taken from the herd, and not a single case of abortion

has occurred in the herd since, although one of the isolated cows aborted about three weeks later.

In another herd of over 200 head, for the past ten years, with the exception of the last three, a large number of cases of abortion and calf scours occurred each year, and in that herd probably 20 per cent of the older cows would react at the present time to serological tests for abortion; but for the past three years there has not been a single case of abortion. Each pregnant cow was placed in a specially constructed stable near calving time and not returned to the breeding herd until after her genital tract was free from discharge and thoroughly clean. The calving stall was then effectively fumigated and made ready for the next cow. Several breeders are working a plan similar to this at the present time.

These same premises at one time were badly infected with tuberculosis, and after it had been eradicated preventive measures were put into operation, and there has been no return of tuberculosis for at least four years.

In this same herd calf scours was successfully prevented by giving the dam a clean place at parturition time and keeping the calf in a clean place for at least one week after birth. Calf scours has been prevented on several farms in the same way. We know of several instances where it seemed impossible to raise any calves, but when the above practice is put into operation no losses from white scours occur. White scours is successfully and practically prevented by giving the dam a cleaned and fumigated stall at parturition time, the calf being kept in that clean stall or another similarly cleaned one for about one week after birth.

A farm devoted to the raising of purebred hogs, said to be the largest of its kind, was kept free from transmissible swine diseases, though situated in a district where cholera was prevalent. This was accomplished by preventive measures, such as thirty days' isolation of newly purchased swine, proper arrangement and sanitary equipment of buildings and pastures, careful inquiry into the sources of purchased feeds, frequent observance of the physical condition of each member of the herds, and the applying of approved methods of feeding and breeding.

It has been demonstrated on numerous occasions that proper housing, ventilation and management are the greatest measures in the prevention and repression of poultry diseases.

Johne's disease of cattle is becoming of serious importance in some herds, and in our State when it has once gained foothold it is the most baffling of all diseases. Fortunately not many herds are afflicted. The best that we can recommend is that breeders should be very careful not to buy from affected herds.

At the 1913 meeting of this Association it was the unanimous opinion that the public watering trough was one of the most important factors in the transmission of glanders and the individual drinking cup one of the best methods to prevent transmission of that disease. On numerous occasions it has been proved that those opinions were a stimulus to the installation of proper preventive measures.

We suggest, in order to bring about more interest and to stimulate more enthusiastic action in this subject, that the following be given consideration and study by members of this Association:

1. Let prevention of disease, rather than disease itself, act as the medium that brings the animal husbandman and the veterinarian together.

2. Closer unity of Federal and State officials dealing with animal diseases, with the various health and educational departments, physicians, hospitals, medical and agricultural colleges and other institutions of learning.

3. Veterinary and agricultural colleges could do more toward disease prevention if stress were placed on this subject during the courses of instruction.

4. There should be a better understanding by the people of the intercommunicability of diseases and the relation of animal diseases to public health.

5. Federal, State, municipal and practicing veterinarians should become better acquainted with, recommend and practice preventive methods.

6. Areas now free from disease may be kept free if the owners of livestock are aware of the danger of purchasing from outside areas and are familiar with the necessary precautions against disease.

7. Federal and State officials should give more attention to maintaining the health of animals on premises where there is no reason to believe transmissible disease exists.

8. A system of identifying animals whereby they may be traced to previous owners.

9. Closer cooperation of State, Federal and municipal agents,

boards of health and butchering establishments with the view of finding the source of diseased animals.

10. The vendor of a diseased animal, sold for food purposes, should be liable for the purchase price when such animal is condemned in the hands of the butcher. In this connection special legislation would be helpful.

11. Legislation requiring a tuberculin test of cattle and mallein test of horses offered at public sales.

12. Strict legislation on the spread of hog cholera and bovine abortion and other transmissible diseases through public sales.

13. Poultry and sheep diseases cause large losses which could be materially reduced if our profession were to give more attention to their prevention.

14. Much could be done by quarantine, sanitary and disinfecting measures in preventing influenza in horses and other diseases incidental to shipping, distemper in dogs, etc.

15. Disinfecting of stockyards and stock cars.

16. The value of more publicity through agricultural and daily press and county farm bureau organizations.

We recommend that this Association appoint a Committee on Disease Prevention to consider the above suggestions and make additions; that the committee report at the next meeting of this Association.

Should not the members of this, the greatest of all associations of its kind, take advantage of the above examples, which were made possible by some of our outstanding, wide-awake and thinking stockmen, who, by employing the fundamental principles of prevention, have gone a step beyond us? Should we not take their examples as our fundamentals and formulate methods which will do for others what these men have done?

We firmly believe that preventive measures are equally important as detecting and removing diseased animals. We wish that more could see and appreciate the importance of prevention.

We are thoroughly optimistic of the future and we believe that it holds much in store for our profession and stockmen. Our appeal is that veterinarians and stockmen unite more closely than ever before; that we think and work in unison as smoothly as the swinging of a pendulum, to the end that we can spend at least half of our time and knowledge in devising better methods of disease prevention rather than in concentrating all our agencies upon one line. Until that is done, we veterinarians will not be in position to act in capacity of expert advisers.



Veterinarians have a tremendous responsibility. Are we exerting ourselves to the fullest extent to meet this responsibility adequately?

If we are to merit the continued confidence of stockmen and their organizations as expert advisers, we must be able to do infinitely more than to diagnose and treat disease.

Stockmen are equally concerned in knowing how to prevent disease.

#### DISCUSSION

DR. MAURICE C. HALL: The paper which I will present is along the same line as Dr. Munce's paper, and I am under the impression that it does not entirely agree with some of the statements. As you all know, however, when a paper is read to you it is very easy to misunderstand it or to get a false impression, and I am not sure that I have understood Dr. Munce correctly. However, I think he took the position that prophylaxis was always feasible in the transmission of a disease, and if my understanding was correct, I can hardly agree with that statement. I think you all recall that during the "flu" epidemic during the war a great many elaborate precautions of a prophylactic nature were taken, to no avail. You will recall that in connection with yellow fever, before it was known that the mosquito was the transmitter of the disease, elaborate prophylactic measures were used. It is possible to figure out prophylactic measures even where a life history is not well known, but under those conditions the measures are not usually feasible or practical, and therefore not valuable.

DR. J. A. KIERNAN: I am in thorough accord with all the sentiments expressed in Dr. Munce's most admirable paper. I rise only to call attention to a reference he made to comments from livestock owners respecting the accredited-herd plan. My understanding of that comment was that animals added to accredited herds are permitted to be introduced and fully accredited after being subjected to two tuberculin tests sixty days apart.

From the very inception of the accredited-herd plan it was recognized that it was not 100 per cent perfect, but it had to be made a practical operating plan that would fit into the business of raising livestock. It is true that animals after two tests may be added to herds, but that it works out in a practical way I want to demonstrate by data obtained in the retesting of the 8,000 accredited herds that are upon the list. Some inquiries were made as to the number of accredited herds removed from the list during the year. These data cover the fiscal year terminating June 30, 1921. It is true that not all of the 8,000 herds on the accredited list were subjected to a retest, but upwards of 3,000 of those herds were. There were removed from the accredited list during that time 87 herds. Eighty-seven herds of animals that at a previous test had passed the tuberculin test upon a second test were found tuberculous and were removed. For other causes there were removed other animals; for instance, animals exposed to infection at shows, at livestock expositions; 27 herds were taken off the list for that reason. Of the 87 herds, the total number, there were but 33 herds containing more than 2 animals and 14 herds that contained more than 3 animals.

I think any kind of a regulation or any kind of a business that has so few errors and so few omissions in it, as has this accredited-herd plan, can stand such criticism as has been made by the owners. As I say, it is a practical proposition and was made for the practical owners.

There was another matter mentioned in the paper. I don't want to misquote Dr. Munce, but my understanding was that during the foot-and-mouth disease outbreak complaint was made that the infection was spread by veterinarians and inspectors. I don't know how that was in some territories, but I had the privilege of working in three or four States and in McDonough County, Illinois, in which there was more infection than in any similar area in the United States, having more than 200 herds condemned in that area. We had occasion to trace the spreading from farm to farm in defense of that very accusation that inspectors and veterinarians were distributing the infection, and in not one single instance could we find, after an exhaustive investigation, where a veterinarian or inspector had spread the disease. We traced the origin and spread of infection, and presented the results at the conference on foot-and-mouth disease held in Chicago in December, 1914, when a number of livestock owners and lawyers were casting aspersions upon the veterinary profession that they were spreading the disease, and we outlined the facts and how the disease was spread.

COMMISSIONER J. M. WHITTLESEY (Hartford, Conn.): Dr. Munce, I think, is portraying somewhat eastern conditions. I am from New England. I think Dr. Munce's paper is one of great importance. I wish to call your attention to a few herds we have found in Connecticut where evidently the great spread of tuberculosis was the fault of feeding and managing the cattle. We found some suffering from malnutrition. We found a very heavy percentage of tuberculosis in herds that were crowded to the limit of production and housed in barns the year around and forced during the war to produce the maximum amount of milk and that suffered physically. We got a tremendous spread in those herds. I presume that paper of Dr. Munce's will interest those who are dealing with eastern conditions more than the western cattlemen, but it certainly is a very important subject to me.

DR. CARY: I think this is a very valuable paper. I think one of the most valuable suggestions made by Dr. Munce was the suggestion that we have a committee appointed by this section or the general association to cover this subject and bring out the question of prevention of various conditions in various parts of our country. I think if it is in order a motion ought to be made to that effect and have a committee appointed. Whether it should be done before this section or the general house is another question, but I think that should not be overlooked.

CHAIRMAN JAKEMAN: Dr. Munce, do you wish to reply to the discussion?

DR. MUNCE: It was not my intention to reply. I did not intend to precipitate any discussion or any criticism of the accredited-herd plan, but I simply expressed as best I could the questions that were brought to our attention by some of our good stockmen. They asked this question, If it is safe to accredit cattle whose history in many cases is unknown, why isn't it safe to accredit herds on two negative tests sixty days apart whose history is known?

On the matter of spreading infection by foot-and-mouth disease, I simply tried to emphasize by that illustration how important it is that veterinarians—I wasn't speaking of inspectors or any other branch of the veterinary profession—be exceedingly careful about carrying infection. We had in Pennsylvania several cases where foot-and-mouth disease was carried by careless veterinarians.

I made the suggestion in reference to a committee because I felt that the subject was being neglected as it is, and it is of such tremendous importance that perhaps it might be well to consider that suggestion, if the Association sees fit, at the general session.

## GENITAL INFECTIONS IN THE BULL

By HERBERT L. GILMAN

*Department of Obstetrics and Research in the Diseases of  
Breeding Cattle, New York State Veterinary College,  
Cornell University, Ithaca, N. Y.*

THE STUDY of the infections of the genital organs of the bull, and the associated structural changes, offers practically a virgin field for intensely interesting research work. Veterinarians and breeders have long recognized the bull as a potential factor in the spread of genital infections in the herd, but even then he was usually looked upon as merely a mechanical carrier of the organisms. The fact that he might be an active spreader has been quite generally overlooked. Too frequently the ability of a bull to copulate in an apparently normal manner is taken as conclusive evidence of his procreative powers. The question as to whether or not the semen contained normal active spermatozoa, and whether the genital organs harbored organisms capable of being transmitted to the female during ejaculation of the semen, seems to have been entirely disregarded until comparatively recently.

It has been demonstrated by Carpenter (1) that the genital organs of cattle harbor several species of organisms, other than the Bang bacillus, which interfere with reproduction. The question is, Does the genital tract of the bull become infected with these same organisms, and if so, are they eliminated with the semen and is the female infected during copulation? Likewise, what gross and histological changes occur in his genitalia, and if so, what functional changes result therefrom? Clinical evidence clearly incriminates the bull in a large number of cases, and the clinical findings, substantiated by laboratory diagnoses, demonstrate that the bull often becomes a dangerous source of genital infections in the herd.

Disregard for the part played by the male has by no means been confined to the veterinarian, for the physician likewise has, until comparatively recent years, almost entirely neglected or failed to appreciate sterility in the male. His part also in the transmission of the general genital infections has been given little or no consideration. Careful and painstaking study of the subject has proven that the percentage of male sterility is quite

high, and that he plays a very important part in the spread of venereal infections other than those of a specific type. Even otherwise normal healthy men are occasionally encountered in whose semen no spermatozoa are found. Conditions are practically identical in the bull as far as the work has been carried on. The genital organs of the bull are even more accessible to clinical examination than those of man, and his semen more easily obtained.

The bull, when once infected, is a much more dangerous spreader than the cow, due to his intercourse with so many females. The cow may spread her infections merely to the bull or bulls with which she may copulate, while an infected bull naturally becomes a disseminator to as many females as he may be called upon to serve. It remains, therefore, for the veterinarian to consider the bull in the study of genital infections in every herd which he is called upon to treat. Comparatively too much attention has been given to the diseases of the cow, with practically no consideration of the source and mode of transmission of the infections.

References to the part played by the bull in the spread of "contagious abortion" as caused by the Bang bacillus are quite numerous. Bang (2) originally called attention to this fact, but came to no definite conclusions. Later McFadyean and Stockman (3) attempted but failed to infect cows by using a soiled bull for service. Hadley and Lothe (4) state: "A large number of stockmen hold that the bull is an important factor in the transmission of contagious abortion in herds. A smaller number believe that the bull acts merely as a passive carrier of the abortion disease and is not actively concerned in the transmission." Their attempts to infect abortion-free heifers with abortion-infected bulls were negative.

Buck, Creech and Ladson (5) applied the agglutination test to 325 mature bulls, of which 288 were negative and 37 positive. *Bacillus abortus* was isolated from five animals, of which three showed marked lesions, two in the seminal vesicles, and one in the left testicle. They conclude: "*B. abortus* may involve organs of the generative apparatus of bulls, producing chronic inflammatory changes. Of the generative organs, the seminal vesicles appear to furnish the most favorable site for the lodgement and propagation of abortion infection."

Schroeder and Cotton (6) cite the case of a bull which re-

acted to the abortion test, and on postmortem *B. abortus* was isolated from an abscess of one epididymis. They state: "Our attempts to produce a similar case of infection artificially failed; and, in agreement with the difficulties many investigators have had to obtain incriminating evidence against bulls, we have thus far failed to infect bulls in any way that justifies the assumption that they are important factors in the dissemination of abortion disease." Further, they conclude: "Regarding the dissemination of abortion disease by bulls we may say, however, that it would be foolhardy in the dim light of our present knowledge to take liberties with reacting bulls, or bulls from infected herds, or promiscuously used bulls."

The work so far discussed shows that *B. abortus* has occasionally been isolated from the genitalia of bulls, and that they do at times react to the agglutination and complement-fixation tests with *B. abortus* antigen. Attempts at artificial inoculation by natural channels have failed, with the possible exception of McFadyean, Sheather and Minett (7), who were able to infect the bull by the prepuce in two cases and by mouth in one case. The results, however, are by no means conclusive, and the duration of the infection and transmission to the cow are not discussed. They conclude, nevertheless, that cattle of any age and either sex may be infected by natural channels with the bacillus of epizootic abortion. Proof of the transmission of *B. abortus* by the male to the female has at no time been brought forward, and even the possibility of his acting as a mechanical carrier is merely assumed.

Hadley (8) states that unquestionably the male often becomes infected with germs that produce the various secondary diseases in the female, which are more properly classed under the more inclusive term of "abortion disease." Further on he states that douching the bull before and after service certainly will keep the bull from transmitting the organisms that cause the secondary infections. One might infer from this that Hadley believes that the genitalia of the bull become infected with many varieties of organisms, and that they are transmitted to the female, producing disease in her reproductive canal. However, he does not state just what the secondary infections are. Even though the internal genitalia did become infected, and the organisms were eliminated during ejaculation, no amount of douching would prevent the transmission of the infections.



The work so far reviewed has been limited to infection with and the transmission of *B. abortus*, with no attention to or regard for other infective agents which have been proven to be intimately associated with diseases interfering with reproduction in the female. While this organism is a very vital factor in the problem of genital infections, the organisms usually referred to as "secondary invaders" are of primary importance and must never be overlooked if one is to get a clear understanding of the problem. Their role is by no means insignificant.

The semen, until the work of W. W. Williams (9), received only slight attention in the study of sterility in cattle. Its normal character has been simply taken for granted. In his work he calls attention to the importance of an examination of the semen in diagnosing sterility in the bull, giving methods for the collection of samples, staining, and some of the abnormalities encountered. The work is fundamental and should stimulate interest in this important method of diagnosis. Later he goes into a more extended discussion of the problem, concluding that the clinical examination is of vital importance. Of 40 bulls examined, he finds that 20, or 50 per cent, showed lessened fertility, and others aside from these showed minor changes in the genital organs or semen. W. L. Williams (10, 11) calls attention to the same fundamental problems, and in a subsequent paper (12) states: "Clinical studies now indicate with great clearness that the bull is an active spreader of that group of genital infections which cause sterility, abortion and related phenomena."

Most of the present studies have been carried on in cooperation with the last two mentioned authors, in the hope of correlating the clinical and laboratory findings.

In order to bring out the pathological changes encountered, some points in the anatomy, gross and histological, and physiology will be briefly reviewed.

The testicles are relatively large, measuring 14 to 17 cm. in length, including the epididymis, and 6 to 8 cm. in diameter. The tunica albuginea is quite thin and consists of connective tissue which is rich in elastic fibers. On account of its distinct connective tissue structure it is not distinguishable from the tunica vaginalis which is fused with it. Inside the tunica albuginea is a loose layer of connective tissue, which, on account of its rich supply of blood vessels, is termed the tunica vasculosa.

The parenchyma of the testis is of a yellowish gray color. The mediastinum testis is an axial connective tissue structure running through the gland, star shaped on section, and sending numerous connective tissue strands between the lobules. The lobules consist of the seminiferous tubules, which, on account of the courses they take in the different regions, are divided into three groups. The peripheral tubules are the much-contorted tubuli contorti. These join up to make the tubuli recti, which near the mediastinum break up to form a network, the rete testis. The rete proceeds through the mediastinum, to form the efferent ductules which break through the tunica albuginea, to form a part of the head of the epididymis. The tubuli contorti, which form the spermatozoa and make up most of the parenchyma, have a width of 120 to 200 microns. The lobules are made up of a peripheral thin membrana propria and the seminal epithelium, which consists of the essential sperm-forming cells and the cells of Sertoli. The sperm cells are many-layered, consisting of the peripheral layer of spermatogonia. These in turn divide, giving rise to a more central layer of primary spermatocytes, which in turn divide through secondary spermatocytes, spermatids, and finally the spermatozoa are formed. The cells of Sertoli are large cells of indistinct outline, sending protoplasmic processes out into the lumen. In the final stage of transformation of the spermatids into spermatozoa, the latter bury their heads in these protoplasmic processes of the Sertoli or nurse cells which furnish them with nutritive material. Finally the spermatozoa mature and become free in the lumen. The interstitial connective tissue between the tubules contains numerous large interstitial cells. They are comparatively delicate, slightly granular cells with abundant protoplasm which contains many fat globules. These cells furnish an internal secretion which governs the development of the secondary sexual characters.

The head of the epididymis is made up of lobules formed by the much-coiled efferent ductules proceeding from the rete. These ductules unite to form the body of the epididymis, which remains quite coiled and runs along the posterior medial part of the testicle, to which it is more or less closely attached. At the lower extremity of the testicle it forms the tail of the epididymis, finally ending in the ductus deferens. The epididymis is lined by a pseudo-stratified, columnar, ciliated epithelium.

Outside this is a *membrana propria*, a circular muscular layer, and a connective tissue coat.

The *vas deferens* is quite narrow (2 mm.) and runs from the tail of the epididymis to the *colliculus seminalis*, where it empties into the urethra. At first it is lined by epithelium like that of the *vas epididymis*, but changes over into a stratified columnar type with occasional motionless cilia. The *tunica propria* is a thin fibrous layer. The submucosa consists of thin connective tissue. Three muscular coats are present, an inner thin longitudinal layer, middle circular, and outer longitudinal layer. These are surrounded by the adventitia, made up of connective tissue, elastic fibers and scattered longitudinal muscular cells of the internal cremaster muscle. The function is the conveyance of the spermatozoa with some of the seminal fluid from the epididymis to the ejaculatory duct. Near the posterior part of the bladder the two ducts are in close apposition, and for 10 to 12 cm. dilate to form the ampullæ. Here the mucous membrane becomes much plicated and not unlike the folds at the fimbriated end of the oviduct.

The seminal vesicles are compact glandular structures lying on either side of the median line, dorsal to the ampullæ and ventral to the rectum. In the mature bull they measure 10 to 12 cm. in length, 4 cm. in width, and about  $2\frac{1}{2}$  to 3 cm. in thickness. The glands are quite tortuous and are often asymmetrical in size and shape. The excretory duct of each opens into the urethra in common with the ampullæ of the *vasa deferentia*. Microscopically the gland consists of vesicles lined by pseudo-stratified columnar epithelium. On the outside of the gland is a thick connective tissue layer which sends thin trabeculæ in between the vesicles or alveoli. The function is to supply the principal fluid content of the semen. Spermatozoa occasionally work up into the lower part of the gland, but ordinarily the fluid is a gray, milky, mucoid material, containing few or no spermatozoa.

The *colliculus seminalis* is a rounded prominence about 2 to 3 cm. in length, at which open the ducts of the *vas deferens* and seminal vesicles by small slit-like openings. There is no distinct ejaculatory duct in animals. The function of the *colliculus* is to prevent admixture of urine with the semen by shutting off the upper part of the urethra during ejaculation.

The prostate consists of two parts, which are continuous with

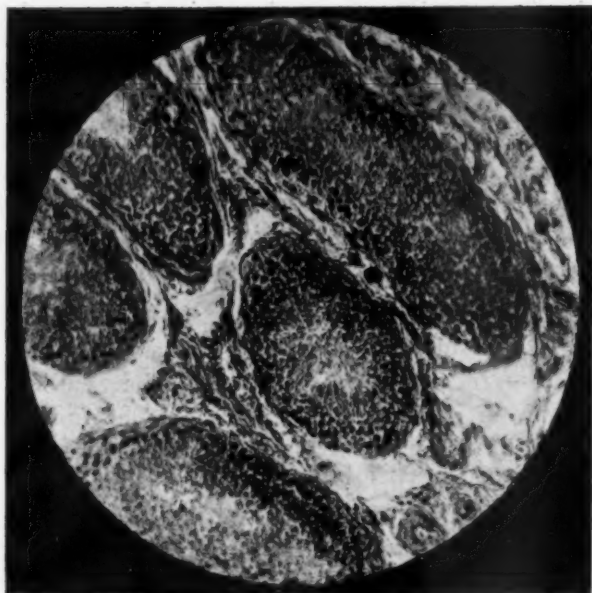


Fig. 1—Normal testicle of bull. (High power magnification.)

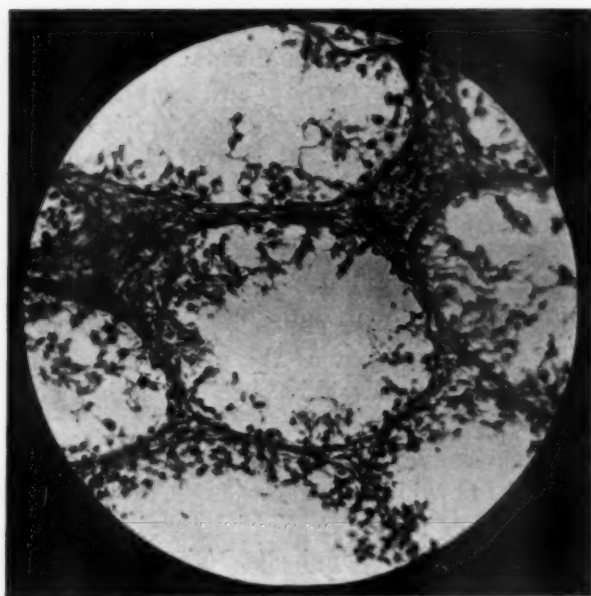


Fig. 2—Testicle of bull, showing marked desquamation and degeneration of the seminal epithelium lining the tubules. (High power.)



Fig. 3—Normal seminal vesicle of bull. (High power.)

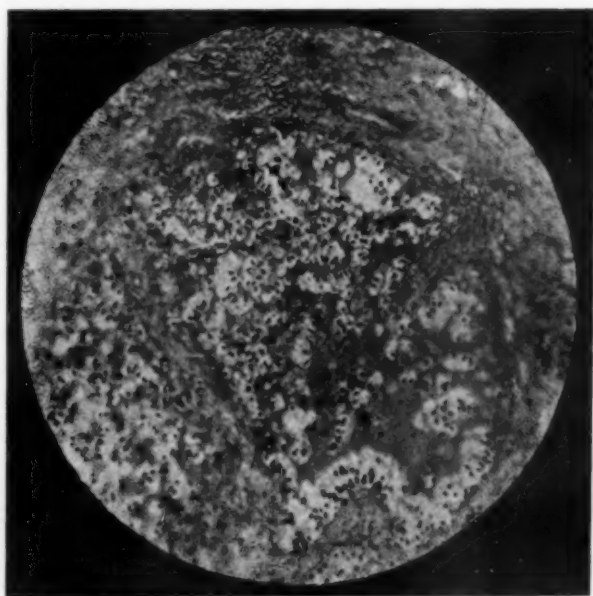


Fig. 4—Seminal vesicle of bull, showing advanced stages of degeneration and desquamation. The lining membrane of the vesicles has disappeared and the lumina are filled with detritus and exudate. (High power.)



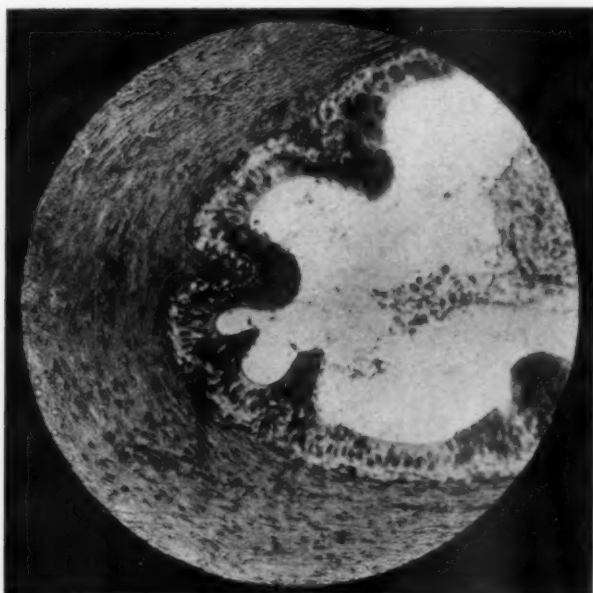


Fig. 5—Normal ductus deferens of bull. (High power.)



Fig. 6—Ductus deferens of bull, showing desquamation of the lining membrane and exudate into the tube lumen. (High power.)

each other. The body is 3 to 4 cm. in width, 2 cm. long, and 1 to 1.5 cm. in thickness, extending across the dorsal surface of the neck of the bladder at the origin of the urethra, and over the colliculus seminalis. The pars disseminata surrounds the pelvic part of the urethra. Dorsally it is about 10 to 12 mm. thick and ventrally thins out to about 2 mm. The gland has a branched tubular structure, the interlobular tissue of which contains much unstriped muscle. The prostatic ducts open into the urethra in rows, two of which are between two folds of the mucous membrane that proceed backward from the colliculus seminalis; two other series occur on either side, lateral to the folds. The secretion, the function of which is to furnish part of the seminal fluid and the principal stimulant to the motility of the spermatozoa, is of an acid reaction, milky, and quite albuminous.

The Cowper's glands (bulbo-urethral) are paired, oval structures, about 3 by 2 cm. in size and situated on either side of the pelvic part of the urethra close to the ischial arch. They are covered with the urethral muscle, and both empty into the urethra by a single duct. The structure is compound tubular mucous glands, the gland tubules of which are lined with a single layer of cubical epithelium, and the ducts with two or three layers of similar cells.

The semen when freshly ejaculated is a cloudy, tenacious, more or less coagulable fluid rich in albumen. It is weakly alkaline in reaction, and contains 80 to 90 per cent of water. Of the solid constituents there is 40 per cent of ash, of which three-fourths is calcium phosphate. Besides the spermatozoa, the semen frequently contains epithelial cells, leucocytes, concentric ambyloid concretions and lecithin bodies. When cold, characteristic phosphoric acid salts are precipitated. The fluid content is the product of the tubules of the testicles, their excretory ducts and the accessory sexual glands. This is principally secreted by the ampulla or pars glandularis of the vas deferens and the seminal vesicles. These secretions are thick, homogeneous and gelatinous, resembling sago soup. The amount of semen ejaculated is about 5 to 10 c.c.

The spermatozoon of the bull consists of two principal parts, the head and the tail. The head contains the nucleus and is solely for the fecundation of the ovum, while the long and thread-like tail is for motility. The former, which is comparatively

large, is divided into a darker staining posterior part, an anterior lighter part, and often a still lighter oval area between the two. On the anterior part of the head is a sharpened edge, the acrosome, which serves the purpose of perforating the ovum. The tail is divided into three parts: connecting piece, principal part, and terminal filament. An axial filament runs through the entire length of the tail. The connecting piece, which is the thickest and strongest part, joins the tail proper to the head. It consists of the central axial filament, a spiral filament around this, and an outer mitochondrial covering. The principal part consists merely of the axial filament and a thin outer covering, while the end piece is quite thin and is made up solely of the uncovered axial filament. The length of the entire spermatozoon is 75 to 80 microns, including the head. The head is 9.5 microns long and 5.5 microns wide.

The spermatozoa are nonmotile when discharged from the testicle, and do not become motile until they come in contact with the prostatic secretion (Ellenberger, 13).

The technique used in the collection and staining of the spermatozoa is essentially the same as that described by Williams (9). The methods used in removing the genital tracts and cultural methods of the organisms are identical with those described by Carpenter and myself in the study of the female genital tract.

#### PATHOLOGY

The pathological changes encountered are quite numerous, but merely the nonspecific types will be considered here.

The testicle seldom presents gross alterations of structure except for abscessation, which, according to Williams, occurs more frequently in the bull than in any other domesticated animal. He also states that arrest in the development of the testes by which they remain soft, flaccid and somewhat smaller than normal is not uncommon. The epididymis is occasionally the seat of necrotic processes, as evidenced by swelling, tenderness and abscess formation. In two instances cases were encountered in which the head of the epididymis was much enlarged and firm, due to a chronic proliferative inflammation. On section the efferent ducts of the epididymis were much atrophied, the lining membrane was degenerated and desquamated, while the interstitial tissue was much increased in amount. Abscess formation may occur either here or at the tail of the epididymis,

where it is more frequently encountered. Occasionally the ducts show slight desquamation and some degeneration of the lining epithelial cells, without any gross manifestations. Microscopically, the testicular tissue is the seat of pathological processes. Perhaps the most frequent condition encountered is desquamation and degeneration of the seminal epithelium. The process may be seen in various stages, from only slight exfoliation to almost complete disappearance of the essential semen-forming cells (figs. 3 and 4). In one instance total disappearance of the seminal tissue with marked thickening of the membrana propria was encountered, associated with an extensive increase of interstitial tissue. In every genital tract examined (146) I have failed to find one in which there were not present many small strands of connective tissue between the tail of the epididymis and the adjacent part of the parietal layer of the tunica vaginalis. In some instances infection was present, while at other times the strands were evidently the result of some previous infection.

The ductus deferens frequently shows degeneration and exfoliation of the lining membrane (figs. 5 and 6), and when this occurs it is usually associated with changes in either the testicle or seminal vesicles.

In man the duct becomes occluded by a chronic inflammation, but so far I have failed to find evidence of this condition in the bull. Undoubtedly, however, this condition does occur occasionally.

The seminal vesicles are perhaps the most common seat of infection and pathological changes. The acute form of inflammation is accompanied in some instances by enlargement either of one or both glands. On rectal palpation this may be quite easily distinguished, and pinching of the part causes a distinct flinching and evidence of pain.

Together with the enlargement it becomes somewhat softer and flabby or even hard in the early stages. On microscopical examination there is usually extreme hyperemia of the entire part, with varying degrees of desquamation and degeneration of the epithelium lining the vesicles. The normal clear mucous secretion becomes mixed with fibrin, leucocytes and cellular debris. In the more severe types the entire epithelium becomes desquamated and necrotic with more or less loss of definite structure in the gland. Cystic inflammation may occur, in which

case the cysts may involve only one or two lobules or occasionally the entire gland. Abscess formation is not infrequent, in which case the entire gland becomes made up of small abscesses, or the entire gland may be one large necrotic encapsulated mass. Chronic inflammation is evidenced by a distinct enlargement and firmness of the gland. On microscopical examination most of the gland is composed of firm sclerotic tissue in which here and there one finds remains of the degenerating vesicles. This type may or may not be accompanied by adhesions to neighboring parts. In one case encountered, the glands were much enlarged, sclerotic and almost lost in a large mass of adhesions.

The prostate and Cowper's glands no doubt are frequently involved in inflammatory processes. However, unfortunately, these glands were more or less neglected in the work, with the result that changes may have been present though not detected.

The semen presents a most interesting and essential subject for routine examination and study. While the advances made so far have been more or less elementary, the work has demonstrated that its study is a very valuable aid in the diagnosis of infertility in the bull. Not only is the seminal fluid frequently the carrier of several varieties of bacteria associated with genital infections, but in a large percentage of cases the essential spermatozoa are abnormal either in their motility or morphology or both. Likewise the seminal fluid is subject to changes which are often detrimental or injurious to the existence of viable spermatozoa.

It has been demonstrated that very frequently the bull harbors streptococci, micrococci and other organisms associated with genital infections in the female. These organisms become localized in the seminal vesicles and testicles, and during ejaculation of the semen are discharged and deposited in the vagina of the female. Bacteriological studies on the semen are not on the whole entirely satisfactory, but are sufficient, I believe, to demonstrate this fact. The method employed consisted in douching and disinfecting the vagina and sheath after the method suggested by Williams. Samples of vaginal mucus were then taken for study, following which the semen was removed after coitus. The vagina usually harbors organisms, though on smear but a few are ordinarily seen. In the bulls of high fertility the semen obtained by this method failed to show many organisms, most or all of which probably came from the vaginal mucus.



The semen from many sterile bulls or those of low fertility, however, clearly showed that a large number of organisms must have been eliminated with the semen. Likewise the organisms isolated agreed culturally and morphologically with those found in diseased seminal vesicles and testicles. Perhaps some of these organisms were brought in by a penis contaminated by the exterior of the cow, but the number and type of organisms found would tend to make this source of contamination improbable.

The seminal fluid, besides being frequently laden with bacteria, is in many cases abnormal. In one instance the fluid was quite thick, of a yellowish green color, and of a distinct acid reaction. The secretion from the seminal vesicles was later found to be of this same character, and the glands had undergone diffuse abscess formation. The fluid may frequently contain pus, or rarely blood. Decrease in the amount of fluid, or a thin watery condition, is not infrequently encountered. In one instance the semen appeared in all ways like a thin, serous fluid.

Distinct changes in the motility and morphology are, however, the main features to be looked for in the study of the semen. Not infrequently complete azoospermia is met with, however, with quite distinct changes in the character of the seminal fluid. In the examination of the motility the semen is best studied with the use of a warm stage, or if this is not available, a drop of the semen may be placed upon a warm slide. Motility may be observed with the aid of the low or high power lens, though often it is best to use a cover-glass and the oil immersion. Normal vigorous spermatozoa show a vigorous lasting motility which persists for hours, or even days under proper conditions. Abnormalities of motion are manifested by sluggish motion of all or part of the cells present, abnormal types of motion, or, in many instances, entire absence of motion.

Anatomical changes encountered were mostly confined to loss of the tail, and irregularities in staining of the nucleus. Some specimens show mostly headless sperms in the field, while others show but a few without tails. The irregularities in staining are manifested by unusual difficulty in obtaining a clear differential staining of the head. Abnormal forms such as spermatozoa with two heads, thickening of the connecting piece of the tail, diminutive size of the head, etc., are by no means uncommon. Their significance is not understood, but they are

probably the product of some derangement in the seminal epithelium.

The bacteriology of the male genital tract was studied upon the genitalia of 10 normal young (6 to 8 weeks) calves, 2 mature fertile bulls and 12 mature infertile bulls. Four aborted fetuses and 5 calves dying from calf infections (scours and pneumonia) were also cultured, as well as 11 bulls slaughtered at an abattoir. In the latter group no history was available, as was the case in nearly all of the others.

The seminal vesicles and testicles of the normal calves were sterile in all but two cases. From these two tracts a staphylococcus was isolated from one seminal vesicle of each. In one aborted fetus a streptococcus was isolated from both the seminal vesicles and testicles, this same organism being obtained from the heart's blood. In another *Bacillus coli* was isolated from all parts, with a general colon septicemia. Micrococci and streptococci were in several instances obtained from the seminal vesicles, testicles, or both, from this group of animals. In each instance the organisms were identical with those isolated from other parts of the fetus or calf.

Adult bulls of known fertility were naturally difficult to obtain, only two being available for examination. These were from the experimental herd kept by the department, and have always had an excellent breeding history. One bull had a severe attack of scours when a few weeks old, while the calthood history of the other is not known, he having been bought after sexual maturity. Cultures from the genital tract from the first-mentioned bull were entirely negative except for the presence of a streptococcus isolated from the left epididymis and left scrotal sac. All organs were normal except for numerous fine connective strands running from the tail of the epididymis to the adjacent part of the parietal layer of the tunica vaginalis in both testes. The tract of the other failed to show any organisms. The only evidence of any abnormality was the presence of the same fine connective tissue strands as were in the other tract.

In the mature sterile bulls, or those of low fertility, there was a comparatively wide variation in the type of organisms encountered, though the streptococci and micrococci were the most common invaders. The tail of the epididymis and the seminal vesicles are the most common seat of infection, the latter being infected in nearly all sterile bulls so far examined. One very

interesting case noted was that of a bull with a history of suddenly becoming sterile. The semen was semifluid, greenish yellow in color, and contained very few nonmotile spermatozoa. On postmortem the vesicles had undergone abscess formation and contained the same greenish yellow material which had been discharged during copulation. *Streptococcus hemolyticus* and *Pseudomonas pyocyaneus* were isolated from both vesicles. In one bull a watery condition of the semen was found to be due to cystic degeneration of the vesicles.

The tracts obtained from abattoir bulls were not always infected, but most of those examined bacteriologically demonstrated that the infection is quite widespread. Gross and histological changes of the seminal vesicles were by no means uncommon, as well as degeneration and desquamation of the seminal epithelium of the testes.

*Micrococcus aureus* and *albus* were isolated in nearly all cases, though usually associated with *Streptococcus viridans* or *hemolyticus*. When checked up with the organisms found in the semen, the two appeared to be identical in every way. *Bacillus coli* was encountered but twice, and then in the vesicles.

I have so far failed to obtain *Bacillus abortus* from any tract, either by direct culture or guinea-pig inoculation. The agglutination tests with *B. abortus* antigen were all negative except for two bulls from the abattoir. In three instances an organism was isolated from the seminal vesicles which agreed culturally and morphologically with *B. abortus*, but guinea-pig inoculation with the cultures of the organism failed to identify it as the Bang bacillus. Likewise an antigen made from the cultures were not agglutinated by positive abortion serum.

Clinically, the diagnosis of sterility rests principally upon an examination of the semen, testicles and seminal vesicles. As stated before, in examining the semen one should note the reaction, quantity of sediment and character of the fluid. The spermatozoa should be examined for the relative number present and their motility, which may be vigorous, sluggish or absent. In staining one must look for poor staining of the head and for morphological abnormalities. The presence of bacteria, leucocytes or an unusual number of desquamated cells is to be noted. The testicles in each case should be examined for abscess formation, atrophy or any chronic enlargement, especially of the epididymis.

The seminal vesicles in many cases will, on physical examination, be enlarged and firm, soft and flabby, or otherwise diseased. Abscess formation, or cystic degeneration is not uncommon, and occasionally the glands can not be palpitated, due to their being lost in a dense mass of adhesions to neighboring structures. Sensitiveness on pressure is usually evidenced by a distinct flinching on the part of the animal. On the other hand, the vesicles may show no macroscopic evidence of inflammation, it being upon on microscopical section that the gland is found diseased. The spermatozoa will not live in a fluid not suited to their delicate requirements, and since the vesicles furnish most of the seminal fluid which is generally materially altered when the gland becomes infected, these glands should be given a careful examination. Abnormal semen may not be associated with diseased testes, but this is almost invariably the case with diseased seminal vesicles.

While the work so far is but in its infancy, the results are such as to demonstrate that the bull often becomes infected and may be a dangerous source of infection in the herd. The semen is very frequently abnormal and contains bacteria which are similar to or identical with those isolated on postmortem examination from diseased genitalia, especially the seminal vesicles. Likewise these organisms found in the semen are very frequently associated with a wide variety of genital infections in the female. Clinically, as stated by Williams (12): "The cows served by one bull conceive in larger percentage than those served by another. Cows pregnant by a bull of low fertility abort in larger ratio than cows bred to bulls of high fertility. Those cows which are sterile after having been bred to bulls of low fertility often prove persistently sterile when bred to highly fertile bulls. In these cases not only has the bull ejaculated an infection fatal to the spermatozoa and ovum of the coitus concerned, but he has implanted in the genital tract of the cow an infection which prevents fertilization in the future by a fertile bull."

One valuable purebred animal coming to my attention had previously given birth to four normal healthy calves. She was then bred to a pedigreed bull whose history was not looked into. Abortion took place at eight months, with death of the calf, and the cow barely recovered from a severe septic metritis. It would not be surprising to find that her breeding career was at an end.

In one purebred herd attended by Dr. W. W. Williams, service to certain bulls was invariably followed by cervicitis, which later developed into salpingitis, leaving cow after cow hopelessly sterile. The semen and, as found later, the seminal vesicles of these bulls contained virulent streptococci and the seminal vesicles were badly diseased, as demonstrated by clinical and histological examination.

The finding of the fine connective strands between the tail of the epididymis and the adjacent part of the parietal layer of the tunica vaginalis in every bull examined so far demonstrates the extent of the presence of some infection of the male genital tract at some time during life. The presence of organisms in the genital tracts of aborted fetuses and of calves dying from some form of calf infection may signify that infection localizes in the parts early in life, either to die out or lie dormant until sexual maturity, when it becomes intensified, especially by excessive sexual strain. The fact that the tracts from the healthy calves failed to show any bacteria, while those from diseased calves and aborted fetuses usually harbored bacteria, tends to the belief that bacteria are not normally found in the male genital tract. This appears to be so in the young, at any rate. Of the two adult bulls with a good breeding history, one showed no organisms, and the other infection of only one epididymis and scrotal sac. It is interesting to note that the bull harboring the infection, which, by the way, was not discharged in the semen as far as I could find, had had the attack of scours while a calf. Both bulls, however, were used moderately and were doused before and after each service. The presence of the fibrous strands on the epididymis shows that infection had been present in both bulls. Hematogenous origin of the infection is always possible even in the adult. On the other hand, while there is no convincing evidence to support it, urethral infection from serving diseased cows is very probable.

#### BIBLIOGRAPHY

1. CARPENTER, C. M., Professor of Bacteriology, New York State Veterinary College, Cornell University.
2. BANG, R. Die Ätiologie des seuchhaften (infectiösen) Verwerfens. Zeit. Thiermed., Band I, S. 241, 1897.  
Das Seuchenhaften Verwerfen der Rinder. Arch. Wiss. u. Prakt. Thierheilk., Band 33, S. 312, 1907.
3. Report of English Commission on Epizootic Abortion, Appendix to Part I, p. 17, 1909.
4. HADLEY, F. B., and LOTHE, H. The Bull as a Disseminator of



- Contagious Abortion. Jour. Amer. Vet. Med. Assoc., vol. 50, 1916-17, p. 143.
5. BUCK, J. M., CREECH, G. T., and LADSON, H. H. Bacterium Abortus Infection of Bulls (Preliminary Report). Jour. Agr. Research, August, 1919.
  6. SCHROEDER, E. C., and COTTON, W. E. The Bull as a Factor in Abortion Disease.
  7. MCFADYEAN, SHEATHER and MINETT. Researches Regarding Epizootic Abortion. Jour. Compar. Path. and Ther., vol. 26, p. 142, 1913.
  8. HADLEY, F. B. Contagious Abortion Questions Answered. Wis. Agr. Exp. Sta. Bul. 296, Sept., 1918.
  9. WILLIAMS, W. W. Technique of Collecting Semen for Laboratory Examination with a Review of Several Diseased Bulls. Cornell Veterinarian, vol. 10, No. 2.
  10. WILLIAMS, W. L. The Diseases of Bulls. Cornell Veterinarian, vol. 10, No. 2.
  11. WILLIAMS, W. W. Diseases of the Bull Interfering With Reproduction. Jour. Amer. Vet. Med. Assoc., vol. 2 (n. s.), No. 1.
  12. WILLIAMS, W. L. Report of New York State Veterinary College, Cornell University, 1919-20.
  13. ELLENBERGER. Vergl. Mikroskop. Anatomie der Haustiere, vol. 2.

### VETERINARY PRACTICE IN ST. KITTS

Dr. Ernest F. Jardine, Government Veterinary Surgeon for St. Kitts, British West Indies, in sending in his application for membership in the A. V. M. A., sends the following brief but interesting description of his environment and work:

St. Kitts is an area of about sixty-eight square miles, has a population of 25,000, chiefly black. It is a mountainous island, the tallest mountains being from 3,000 to 4,500 feet high. There is only one road, practically speaking, and that one leads around the island, so if you start at a given point and keep going you will reach the place from which you started.

The island is very healthy, and, many of us think, very pretty, having the high mountains with green verdure in the centre, and the sea always in view.

I have a contract with most of the estates on the island to do the veterinary work at so much per quarter. They pay according to the number of animals kept, irrespective of the distance. An estate one mile from town may pay three times as much as one fifteen miles away. That being the case, I leave colic draughts for emergency cases. In the contract everything is included from castrating madam's tom cat to any major operation on the most valuable animal on the place. The amount of work I have to do would be worth twice as much in a big country, but living and house rent and one or two other items are much cheaper; the one counterbalances the other.

## SOME STUDIES IN SWINE ABORTION <sup>1</sup>

By FRED HAYES

*University of California, Davis, Calif.*

THE MATERIAL presented in this paper is the result of about a year's investigational work on swine abortion. In May, 1920, Hayes and Traum reported the results of some preliminary investigations made in three outbreaks of swine abortion in California caused by *Bacterium abortus* (Bang). No cultural, morphologic or biologic difference could be noted between the isolated swine strains and those from cattle, except that the porcine strains grew more abundantly and did not seem to develop such a deep brown pigment as did the bovine strains. This difference, however, was not constant. Since writing the above-mentioned report, absorption tests with rabbit sera immunized against three hog strains from our three different outbreaks, rabbit sera immunized against two bovine strains, guinea-pig serum immunized against one bovine strain, and serum from a naturally infected cow have shown no difference between the organism of bovine origin and those in swine. Porcine strains proved, on the whole, to be more virulent for guinea-pigs, causing, with a few exceptions, involvement of the testes and one or both radiocarpal regions, also general adenitis. Thirteen of 22 guinea-pigs inoculated with porcine strains succumbed within two months, while none of the 12 inoculated with bovine strain died of infection during that period. The dose for each guinea-pig in the above series was similar.

Before publishing our findings a search was made through the index pages of publications in which the etiology of abortion in swine would be discussed. This revealed to us reference to but one report in which *Bacterium abortus* (Bang) had been incriminated as the cause of a natural outbreak of this disease. This reference called attention to the work of Good and Smith, wherein they described an extensive outbreak of swine abortion in Kentucky caused by *Bacterium abortus* (Bang). Traum in 1914 had isolated *Bacterium abortus* (Bang) from the liver, stomach contents and kidney of an aborted fetus from a herd of swine in which many abortions had occurred. No exact history

<sup>1</sup> Presented at the fifty-eighth annual meeting of the American Veterinary Medical Association, Denver, Colo., September 5-9, 1921.

was obtained or further work done in this herd. Later (1919) Connaway, Durant and Newman of Missouri produced abortion in pregnant sows by artificial infection with *Bacterium abortus* (Bang) of bovine origin. Doyle and Spray reported in August, 1920, the isolation of an organism indistinguishable from *Bacterium abortus* (Bang) from a number of outbreaks of swine abortion in Indiana. The report of the Committee on Diseases of the United States Live Stock Sanitary Association for 1920 makes reference to the work of Schlegel in Germany wherein *Bacterium abortus* (Bang) was found to be the cause of certain outbreaks of swine abortion. Other investigations with this organism in relation to abortion in swine are known to be in progress at the present time. These reports, combined with the clinical observation of abortion in swine for many years, indicate increasing evidence that the abortion bacterium is of greater significance in this species than has been generally recognized. The fact that hogs have for many years consumed uncooked dairy products and associated with infected cattle giving off virulent abortion organisms, without serious epidemics of swine abortion developing until recently, is not to be considered lightly in the future if the maximum fertility of breeding stock is to be maintained.

Our principal investigations have been carried on in one herd of swine naturally infected with *Bacterium abortus* (Bang) and with a small herd artificially infected. The results of the experiments herein reported and the interpretations placed upon them can only be suggestive. However, they may be of value as data are accumulated.

#### VIRULENCE OF ISOLATED PORCINE STRAINS

In the three infected herds reported in a preliminary paper *Bacterium abortus* (Bang) was so abundant in the fetuses, fetal fluids and fetal membranes, and so easily cultivated, that little doubt was entertained as to its etiological importance. To test the power of the strains obtained from the three outbreaks to produce abortion, six first-time pregnant Duroc sows, negative to the agglutination test, were given emulsions of 48-hour-old cultures of our porcine strains. Three of these sows each received 1.5 mls of a heavy emulsion intravenously. The other three each received 10 mls of one of the organisms in their

mash twice a day for two consecutive days. Weekly agglutination tests were performed until the subsequent farrowing.

Sow No. 1119 was fed culture 1 (7) in the manner stated above. Complete agglutination of bovine and swine antigens with 0.02 c.c. serum occurred on the thirteenth day after feeding. The agglutinating titer of her serum never went appreciably higher than this, and she farrowed ten live but weak looking pigs 83 days after being fed. *Bacterium abortus* (Bang) was isolated from the fetal membranes and from the stomach contents of one of the pigs which was killed immediately after birth.

Sow No. 1124, fed in a similar manner with culture 3 (2), agglutinated bovine and swine antigens in 0.01 c.c. of serum on the twenty-first day after feeding, and the titer remained at this point for 53 days longer. Her serum then became negative in 0.02 c.c., and she farrowed nine healthy looking pigs 89 days after feeding the culture. Agglutination remained negative in 0.02 c.c. for about ten months more, at which time she again farrowed nine live pigs. *Bacterium abortus* (Bang) was isolated from the fetal membranes at first farrowing but not at the second.

Sow No. 1127, fed in a similar manner with culture 1 (1), agglutinated bovine and swine antigens with 0.01 c.c. of serum on the twenty-first day after feeding, and the titer remained at this point for 28 days longer. Agglutination then became complete with 0.002 c. c. for 21 days more, at which time she farrowed ten normal appearing pigs. On the day she farrowed her blood serum agglutinated in 0.005 c.c., but returned to positive in 0.002 c.c. in a week and remained at this point for eight months longer. This sow later farrowed eight live pigs and one dead one. *Bacterium abortus* (Bang) was not isolated from the fetal tissues at either farrowing.

Sow No. 1118 received 1.5 c.c. of a heavy emulsion of 48-hour porcine strain culture 1 (7) intravenously. On the eighth day after injection her blood serum gave complete agglutination with 0.002 c.c. On the twenty-seventh day after injection she aborted fetuses in about the sixth week of pregnancy. *Bacterium abortus* (Bang) was readily isolated from the fetal membranes and stomach contents of a fetus. For about two months after the abortion her blood continued to give complete agglutination with 0.002 c.c. During the next nine months she was positive in 0.02 c.c. but not in smaller quantities. This sow farrowed

ten live but weak pigs and one dead pig practically seven months after the abortion. *Bacterium abortus* (Bang) was obtained from the stomach contents of the dead pig. Six months later she again farrowed seven live weak and four dead pigs.

Sow No. 1126 received an intravenous injection of porcine culture 1 (1). On the eighth day her blood serum gave complete agglutination with 0.002 c.c. The agglutinating titer remained at least this high for thirteen months against both bovine and swine antigens. Twenty-five days after the injection she farrowed eight live normal pigs. *Bacterium abortus* (Bang) was obtained from the fetal membranes and the stomach contents of one of this litter killed before suckling. Seven months after the injection she again farrowed five normal live pigs and six months later she gave birth to nine live normal progeny.

Sow No. 1121, supposed to have been pregnant when purchased for the infection experiment, proved not to be so, but received an intravenous injection of culture 3 (2). She was bred three months after the injection. Her blood serum agglutinated bovine and porcine strains with 0.002 c.c. on the eighth day. This power was maintained for a little more than six months, and at the seventh month after injection she farrowed nine live pigs and one dead pig. Three weeks later posterior paresis and a vaginal discharge developed, from which she improved slowly during the next two months. When able to walk alone, though with difficulty, she was bred. A month later she was butchered and found to be pregnant. There was no visual evidence of infection in the pregnant womb. *Bacterium abortus* (Bang) was not isolated.

A review of this experiment in infection with *Bacterium abortus* (Bang) indicates that actual abortion is produced with difficulty by artificial infection. Sow No. 1118, injected intravenously, gave a rather classical result by aborting in 27 days. The effect of feeding and injection upon the other five sows, however, was benign, notwithstanding evident implantation of the infection. Their breeding qualities were not materially lessened, although a few of the pigs were born weak and did not long survive.

Some strains of *Bacterium abortus* (Bang) are known to lose their virulence under laboratory cultivation while maintaining their biological ability to produce agglutinins. The cultures used in these experiments were isolated from virulent natural



outbreaks and had not been under laboratory cultivation for more than a month. In five of the six sows infection became established as indicated by the production of agglutinins and by the recovery of *Bacterium abortus* (Bang) from the fetal tissues.

In these artificial infection experiments just described, and also in an experiment with eight young boars and barrows fed or injected with mixed strains of porcine abortion cultures, antibodies appeared in 0.002 c.c. of serum in about eight days in those injected, and in from 21 to 30 days in those fed with cultures.

There apparently are some contributing factors in field infection that do not occur in artificial attempts to produce abortion with *Bacterium abortus* (Bang).

#### AGGLUTINATION REACTIONS IN NATURALLY INFECTED HERDS

In March, 1920, monthly agglutination tests were begun in a naturally infected herd (Herd 2) of 60 purebred swine in which six abortions had occurred between February 8 and March 2, 1920. Quantities of 0.02, 0.01, 0.005 and 0.002 c.c. of the serum to be tested were added to 1 c.c. of the antigen. Both porcine and bovine antigens were used in every test. This was the regular routine, although higher dilutions were frequently made. Whenever complete agglutination occurred with 0.01 c.c. of serum the hog was designated as a positive.

On the first test there were 29 positive, including the 6 aborters, and 31 negative. One month later 6 had changed from negative to positive and 3 from positive to negative, although these new negative sows did not continue to be negative throughout the year.

A study of these agglutination test records for the year shows that practically all of the reactors continued to agglutinate in amounts of serum from 0.02 to 0.005 c.c. for the entire time, and that only 11 animals out of the 48 tested monthly throughout one year remained consistently negative. It is difficult to analyze the agglutination records for interpretation and to account for fluctuations that were obtained in the titer of serum from some of the hogs at different times. The majority of the monthly results, however, were very consistent throughout the year. At the end of the year there appears to be the beginning of a fall in the agglutinating titer in the animals that were regularly positive during this period. Pregnancy and the farrowing act do not

seem to alter consistently the quantity of agglutinins in the blood serum.

#### AGGLUTINATION TESTS AND INFECTION IN PIGS

It has been of interest to observe whether agglutinins are transmitted from positive mothers to their offspring at birth, and also to note whether agglutination will occur in pigs nursing infected mothers. We have not found agglutinins present in new-born pigs, but only a small number have been tested. A total of 116 pigs have been tested at weaning time. Of this number 73 were from positive reacting mothers and 43 from negative mothers, and *Bacterium abortus* (Bang) was isolated from 8 sows out of the 19 giving birth to the 116 pigs. All of these weanlings gave negative reactions. Eighteen of them, all from artificially infected mothers, were placed in a noninfected environment and their blood serum tested again when they were 3, 5 and 7 months of age. They were still negative to the test. Thirty-four (from 8 different mothers—6 positive and 2 negative to the agglutination test) were left in an infected environment and were tested again when they were six months of age. Seventeen reacted positively and 17 negatively.

It appears from this limited observation that neither agglutinins nor *virulent* abortion organisms are transmitted to the offspring at birth or while suckling. It is suggested that a new, and not a latent, infection was responsible for the appearance of antibodies in these 17 shoats left in an infected environment.

#### BREEDING QUALITIES AS AFFECTED BY BACTERIUM ABORTUS (BANG)

The breeding records of eight sows out of eleven known aborters in two herds are available for study in Table 1.

With the exception of sow No. 1118, all of these aborters were in two herds in which the infection suddenly developed during February, 1920, and as suddenly disappeared so far as actual abortions were concerned. No treatment was instituted in these herds except quasi isolation of the aborting sows for the period of any genital discharge. Of the 8 that were retained for breeding, 6 bred and farrowed normally the following fall. One was difficult to get in pig and farrowed 7 live pigs and 1 dead one 13 months after the abortion. The other sow (No. 1118) bred at her regular time but farrowed 1 dead pig in a litter of 11.

TABLE 1.—BREEDING RECORD OF SOWS SUBSEQUENT TO ABORTION (AUG. 20, 1921)

Sow No.	Date of Abortion	Date Farrowed	Remarks
17, Herd 2	Feb. 6, 1920 (77 days)	Following fall and spring litters normal.	No history since.
8, Herd 2	Feb. 8, 1920 (70 days)	.....	Sold March 10, 1921.
6, Herd 2	First litter Feb. 14, 1920 (97 days)	March 15, 1921 (7 live, 1 dead).	Difficult to get with pig.
33, Herd 1	Second litter Feb. 14, 1921 (67 days)	Had normal fall litter (No.?).	No history since.
10, Herd 2	Feb. 15, 1920 (94 days)	.....	Sold March 10, 1921.
46, Herd 2	Second litter Feb. 17, 1920 (94 days)	Oct. 6, 1920 (6 normal). March 29, 1921 (3 normal).	
20, Herd 1	First litter Feb. 17, 1920 (72 days)	Had normal fall litter (No.?).	No history since.
20, Herd 2	Feb. 21, 1920 (47 days)	August 30, 1920 (12 normal). April 15, 1921 (9 normal).	Posterior paresis for three weeks during April, 1920. Recovered.
21, Herd 1	Feb. 23, 1920	Following fall and spring litters normal.	No history since.
27, Herd 2	Mar. 2, 1920 (108 days)	.....	Posterior paresis, April, 1920. Died May 16, 1921.
1118, Exp.	April 19, 1920 (42 days)	Oct. 10, 1920 (10 live, 1 dead). April 6, 1921 (7 live, 4 dead).	Artificially infected sow. Infected March 18, 1920 (intra).

Observations have also been made upon the breeding records of sows in an infected herd in which regular agglutination tests have been made. In Table 2 a record is given of the breeding history of sows whose sera showed an agglutinating titer of at least 0.01 c.c. against both bovine and porcine antigens throughout the year. Table 3 records similar observations upon sows whose sera failed throughout the year to agglutinate bovine and porcine antigens in 0.02 c.c. or less.

A review of Table 2 shows that the 26 positive sows farrowed 276 live and 24 dead pigs during the year. Two became sterile. Ten farrowed no dead pigs and 16 gave birth to one or more dead pigs. In this record are 11 gilts that were positive to the agglutination test from 6 months to a year before farrowing: Five of these (Nos. 35, 68, 75, 51, 60) farrowed from 1 to 4 dead pigs. *Bacterium abortus* (Bang) was isolated from only 1 gilt (No. 68) at birth of pigs. From the 6 that farrowed no dead pigs, *Bacterium abortus* (Bang) was isolated from 4 (Nos. 9, 66, 73, 50). Of course *Bacterium abortus* (Bang) might have been present in more of the sows in either group, but it was not found. At least 2 of the sows (Nos. 28 and 42) discharged *Bacterium abortus* (Bang) at both the first and second litters during the year.

TABLE 2.—BREEDING RECORD OF SOWS SHOWING AGGLUTINATION AGAINST BOVINE PORCINE ANTIGENS

Sow No.	Date of Farrowing	Number of Pigs Farrowed		Remarks
		Live	Dead	
9	Apr. 12, 1920	7	0	First and second litters.
28	Apr. 3, 1921 <sup>1</sup>	10	0	Had 3 previous normal litters.
	Mar. 10, 1920	9	1	
	Sept. 8, 1920 <sup>1</sup>	10	1	
35	Mar. 20, 1920	3	4	First litter.
42	Aug. 17, 1920 <sup>1</sup>	9	0	Had 1 previous litter.
45	Mar. 13, 1921 <sup>1</sup>	11	1	Bred several times between Nov., 1919, and June, 1920. Had vaginal discharge Mar., 1920.
	Oct. 4, 1920	10	0	
49	Mar. 31, 1921	7	0	Bred several times for this litter.
	Oct. 16, 1920 <sup>1</sup>	7	3	
52	Sept. 12, 1920 <sup>1</sup>	6	3	Had 4 previous litters.
54	Mar. 4, 1921 <sup>1</sup>	12	0	Had 4 previous litters.
	Sept. 5, 1920 <sup>1</sup>	6	3	
55	Mar. 4, 1921 <sup>1</sup>	12	0	First and second litters.
	Mar. 5, 1920	3	0	
56	Apr. 8, 1920	9	0	First and second litters.
	Sept. 8, 1920	11	0	
66	Mar. 17, 1921	8	0	Gilt first litter. Positive for year before farrowing.
	Mar. 12, 1921 <sup>1</sup>	8	0	
68	Mar. 10, 1921 <sup>1</sup>	4	1	do.
71	Mar. 23, 1921	3	0	do.
73	Mar. 8, 1921 <sup>1</sup>	4	0	do.
75	Mar. 17, 1921	9	1	do.
31	Mar. 28, 1920	11	2	Had vaginal discharge following first litter. Recovered and bred Nov. 11, 1920, for last litter.
	Mar. 6, 1921 <sup>1</sup>	9	1	
40	.....	.....	.....	Sterile. Chronic endometritis found upon autopsy. Had 8 dead pigs Nov., 1919.
43	Sept. 5, 1920	7	3	Sold. Not in pig April, 1921.
44	.....	..	..	Sterile. Estrum absent. Had had 5 litters.
50	Aug. 12, 1920 <sup>1</sup>	4	0	Gilt first litter. Positive 5 months before farrowing.
51	June 7, 1920	10	1	Gilt first litter. Positive 3 months before farrowing.
60	Mar. 17, 1921	10	1	Gilt first litter. Positive 11 months before farrowing. Had vaginal discharge before breeding.
61	Mar. 19, 1921	8	0	Gilt first litter. Positive for 9 months before farrowing.
65	Sept. 1, 1921	3	0	Gilt first litter. Positive for 5 months before farrowing.
1126	Apr. 12, 1920 <sup>1</sup>	8	0	Sow intravenously infected Mar. 19, 1920
1127	Oct. 18, 1920	5	0	Sow fed cultures Mar. 18 and 19, 1920.
	Apr. 21, 1921	9	0	
	May 27, 1920	10	0	
	Jan. 10, 1921	8	1	

<sup>1</sup> *Bacterium abortus* (Bang) isolated from either the placenta, organs of dead pigs, or vaginal swabs.

TABLE 3.—BREEDING RECORD OF SOWS FAILING TO AGGLUTINATE AGAINST BOVINE AND PORCINE ANTIGENS

Sow No.	Date of Farrowing	Number of Pigs Farrowed		Remarks
		Live	Dead	
32	Apr. 16, 1920	6	2	Had 1 previous litter.
37	Sept. 28, 1920	12	1	First, second and third litters.
	Apr. 5, 1921	4	3	
	Mar. 28, 1920	8	5	
69	Oct. 7, 1920	11	0	First litter
	Mar. 29, 1921	3	1	
41	Mar. 7, 1921	8	0	Feb. 21, 1919—farrowed 8 dead pigs.
	Apr. 16, 1920	13	0	
	Oct. 8, 1921	12	0	
53	Apr. 1, 1921	10	1	Had 2 previous normal litters.
	Mar. 8, 1920 <sup>1</sup>	4	10	
	Oct. 7, 1920	8	3	

<sup>1</sup> *Bacterium abortus* (Bang) isolated from placenta.

In Table 3, five negative sows farrowed 99 live and 26 dead pigs during the year. *Bacterium abortus* (Bang) was isolated from the placenta of only one (No. 53) of these negative sows, although dead pigs appeared in some of the different litters of all of the sows except one. In fact the negative sows farrowed a higher percentage of dead pigs than did the positive sows.

These results seem to suggest that in the case of young gilts infection as indicated by a positive agglutination reaction does not indicate disaster at the first pregnancy to any greater extent than in sows that have had previous litters; that sows may harbor the organisms in the tissues and eliminate them through the genital organs at a normal farrowing; and that some infected sows fail to produce agglutinins to any diagnostic extent.

#### TRANSMISSION OF INFECTION BY COPULATION

Naturally the question of the transmission of *Bacterium abortus* (Bang) by breeding infected boars to noninfected sows and noninfected boars to infected sows is as important as this breeding problem is in bovine abortion. If the results of experiments in swine are applicable to cattle we should have data in the near future that will aid in drawing some positive conclusions upon this question, as well as upon several others concerning which a difference of opinion exists. Some preliminary experiments have been made during the past year in an attempt to throw light upon this phase of the abortion problem.

Ten young boars, which were the offspring of the sows used in the artificial infection experiment referred to earlier in this paper, were utilized in one experiment in an effort to isolate *Bacterium abortus* (Bang) from the testicular tissues. It will be recalled that these sows gave positive agglutination reactions at the birth and during the suckling period of the pigs. The boars had been kept in a noninfected environment and remained negative to test until they were 6 to 8 months old. At this time 8 were injected intravenously and 2 subcutaneously with 2 mls of a saline emulsion of 48-hour-old cultures of three strains of porcine *Bacterium abortus* (Bang). Eight days after the injection 8 of these boars were positive to the agglutination test in 0.002 c.c. One injected intravenously was positive to 0.01 c.c., and the other, injected subcutaneously, showed no antibodies in 0.02 c.c. Fourteen days after the injection 9 were castrated (one having been retained as an infected breeding



boar), and 2 c.c. of a saline emulsion of the testicle and epididymis of each was injected into two guinea-pigs. The guinea-pigs remained well and produced no agglutinins to *Bacterium abortus* (Bang) during the next 30 days.

A similar experiment was tried with 7 young boars from the same source and negative to the agglutination test since birth. These were fed 10 mils of a 48-hour-old mixed culture of porcine strains twice a day for 6 days. No great amount of infection could be demonstrated by the presence of agglutinins. In about 30 days the blood of 4 of these boars agglutinated in only 0.02 to 0.01 c.c., and 3 of them showed no agglutinins in 0.02 c.c. Fifty-four days after feeding the cultures all 7 were castrated. Guinea-pigs inoculated with the testicular tissue gave negative results for *Bacterium abortus* (Bang).

Observations relative to the transmission of abortion infection by positive boars and the infection of boars by positive sows under natural field conditions are difficult to interpret and are not extensive in our experience. In the experimental herd in which natural infection was recognized during February, 1920, there are three herd boars that have been negative to the agglutination test throughout the year, notwithstanding the fact that they have served a number of positive sows during this period.

With reference to transmission of the infection by the positive boar, our observations are confined to two cases, and these are not yet conclusive. An aged Duroc boar that became naturally infected over a year ago was bred in March, 1921, to a negative gilt. This gilt had been negative to the test since birth, although born of an infected sow, and she had been kept in noninfected pens. On July 18 she farrowed one live and four dead pigs. During pregnancy and up to one day after farrowing there were no agglutinins. *Bacterium abortus* (Bang) was not isolated, but from the thoracic fluid of one of the dead pigs a Gram-negative gas-producing organism not yet identified was obtained.

Another gilt (No. 650) with history practically identical to the one just described was also bred to this infected boar. She remained negative during pregnancy and farrowed August 18, 1921, 9 normal pigs. A small macerated fetus about 7.5 cm. in length was found shed with the afterbirth. Cultures have not yet been identified. It may be added that the infected boar bred to these gilts has since been castrated. Guinea-pig inocu-

lations of his testicular tissue proved negative for *Bacterium abortus* (Bang).

#### LOCALIZATION OF BACTERIUM ABORTUS (BANG) IN TISSUES OF INFECTED SWINE

In attempts to locate *Bacterium abortus* (Bang) in the tissues other than testicular, we have data on a few hogs with different histories of infection. In the young boar infection feeding experiment mentioned above there were included two negative barrows (Nos. 602 and 603) which were also fed cultures of *Bacterium abortus* (Bang). Agglutinins appeared in 0.02 c.c. in about 30 days, and in 3 months after having been fed the culture emulsions the barrows were butchered. Guinea-pigs were each injected subcutaneously with 2 mls of a saline emulsion of the kidney, spleen, liver and thyroid and 2 mls of urine from barrow No. 602. Similar injections, with the addition of scrapings from the urethral mucosa, were made into guinea-pigs from the tissues of barrow No. 703. The results of this experiment are not complete, because the guinea-pigs injected with liver, kidney and spleen tissue from barrow No. 603 and with kidney and spleen from barrow No. 602 died with no characteristic lesions in from 3 to 7 days after injection. No agglutinins could be demonstrated from these injections, and *Bacterium abortus* (Bang) was not isolated after death. Negative results were also obtained in guinea-pig inoculations of emulsions of spleen, liver, brain, ovaries, kidney, lumbar glands and amniotic fluid from a sow (No. 1121) intravenously infected on March 18, 1920, and from which *Bacterium abortus* (Bang) was isolated from a dead fetus farrowed in a litter on October 2, 1920.

In only one case have we been able to isolate *Bacterium abortus* (Bang) outside of the genital tract and ovaries. This was from the mammary gland of sow No. 1119, artificially infected by feeding live cultures of porcine origin on March 18 and 19, 1920. On September 19, 1920, she died, apparently from heat stroke. A section of mammary gland was triturated in saline solution and 2 mls injected subcutaneously into two guinea-pigs. In 9 days the sera of the pigs were positive for *Bacterium abortus* (Bang) and the organism was recovered from the spleen and liver.

We have frequently isolated the organism from fetuses and

placentæ and in 2 sows from vaginal discharge 11 and 24 days respectively after abortion.

#### EFFECT OF CASTRATION OF BOARS UPON THE AGGLUTINATING TITER

The habitat of *Bacterium abortus* (Bang) in the tissues of swine, especially in boars and barrows, has not yet been conclusively demonstrated. We have been unable in a limited amount of work to isolate *Bacterium abortus* (Bang) from the testicles or other tissues of infected males. Since we believe agglutinins are the product of persistent stimuli of infecting organisms, it seems logical to expect the titer of a positive serum to recede after removal of the tissue (testicle) commonly supposed to support the infection. In four artificially infected young boars that were positive in from 0.002 to 0.005 c.c. of serum at time of castration the titer was not affected up to one month after castration. In one aged, naturally infected boar (No. 82) the titer dropped from positive in 0.005 to positive in 0.01 c.c. in a month.

#### OTHER ORGANISMS AS A POSSIBLE CAUSE OF SWINE ABORTION

Since our first report of the three California outbreaks in February, 1920, two others have been investigated. In one of the herds *Bacterium abortus* (Bang) was isolated and in the other a nonmotile *Bacillus coli communior* developed in every instance from culture inoculations made from material secured from a sow that aborted. The inoculations were made from vaginal discharge before abortion, from stomach contents and liver of aborted fetuses, and from two partially mummified fetuses. In this herd three sows dropped dead pigs prematurely, six farrowed dead pigs in a portion of their litters, and two went beyond the completion of the gestation period and presumably lost their pigs in the pasture. The sow from which the inoculations were made showed a vaginal discharge several days before abortion, and the attending veterinarian considered the appearance of the aborted fetuses entirely different from others in this outbreak. In the previous cases in this outbreak the aborted fetuses showed a marked sanguinosero-gelatinous infiltration that was absent in these fetuses. Agglutination tests with bovine and porcine strains of *Bacterium abortus* (Bang) yielded 7 negative cases. The serum from one boar was posi-

tive in 0.04 c.c. The serum from the first sow to abort caused agglutination in 0.02 c.c. and was positive to the complement-fixation test. The serum from the last sow to abort and which yielded *Bacillus coli communior* was positive in 0.02 c.c. and minus-plus in 0.01 c.c.

Zeh in Germany reported in 1920 the isolation of a bacillus belonging to the paratyphoid-Gärtner group from the organs and body fluids of fetuses which were aborted in the twelfth week of pregnancy. He obtained a similar organism from all the organs of a pig (on another farm) which died one day after farrowing. He also reports similar findings from two fetuses from still another farm.

#### SUMMARY AND CONCLUSIONS

From the numerous reports of abortion in swine and the frequency with which *Bacterium abortus* (Bang) has been isolated from these outbreaks during the last few years, it appears that we are now confronted with a disease in swine whose importance has been generally underestimated.

It is natural to assume that this infection in hogs is derived from cattle and probably by ingestion of retained afterbirth, aborted fetuses, discharges and milk naturally infected with *Bacterium abortus* (Bang). In our cases there was no direct evidence of infection from cattle, but the possibility of such infection could not be entirely eliminated.

The virulence of porcine *Bacterium abortus* (Bang) as measured by its ability to induce abortions is not pronounced. Only one of these strains isolated from virulent outbreaks in California produced abortion in an experiment including six sows. This abortion was produced by intravenous inoculation. Feeding suspensions of the live cultures caused no abortions in this series, but the organisms found their way to the pregnant womb and were isolated at normal birth of pigs.

Agglutinins appear in the blood of swine injected subcutaneously or intravenously in about 7 days, and in from 21 to 30 days in those fed live cultures.

Natural infection in young gilts 5 to 12 months previous to farrowing does not seem to portend trouble during the first pregnancy to any greater degree than in sows having had previous litters. Positive reacting sows containing *Bacterium abortus* (Bang) in placental tissues may farrow normal litters,

and negative reacting sows may farrow dead pigs. Agglutination by the blood serum therefore is no indication of the outcome of pregnancy.

Vaginal swabs made from two positive sows indicated that *Bacterium abortus* (Bang) may be present in vaginal discharges from 11 to 24 days after farrowing.

There is favorable evidence that infected sows may retain the organisms in the tissues and eliminate them at the termination of succeeding normal or abnormal pregnancies.

Sterility has not been a serious sequela of abortion infection in the herds under our observation.

Agglutinins apparently are not transmitted in utero and were not present in the blood of 116 pigs tested at weaning time. Neither did they appear in 18 of the same pigs kept in non-infected environment up to 7 months of age. On the other hand, 17 out of 34 of those kept in an infected herd reacted to the agglutination test when 6 months of age.

Attempts to isolate *Bacterium abortus* (Bang) from the testicular tissues of 17 boars artificially injected and 1 boar naturally infected with *Bacterium abortus* (Bang) were unsuccessful. Negative results were also secured in locating the organisms in the kidneys, spleen, liver, thyroid and urethra in 2 positive barrows. In 1 sow artificially infected by intravenous injection, *Bacterium abortus* (Bang) was isolated from the udder 6 months after contact with organisms and 3 months after farrowing normally.

Castration of infected positive boars did not materially alter the agglutinating titer of their serum up to 30 days after castration.

#### ACKNOWLEDGMENT

The writer desires to express his appreciation for the valuable support given to him and to this work by Dr. C. M. Haring, and especially to acknowledge the many helpful suggestions received from Dr. J. Traum, also to record his appreciation for the thorough cooperation, through Prof. E. H. Hughes, of the Division of Animal Industry.

#### DISCUSSION.

DR. CONNAWAY: Mr. Chairman and fellow members, Dr. Hayes gave me a copy of his paper to look over, as I had been assigned the duty of opening the discussion. At the outset I wish to express my unstinted admiration for the good work which Dr. Hayes and his colleagues, Drs. Traum and Phipps, have done; and especially so as



the results are closely in accord with those which I and my research associates, Durant and Newman, have obtained, and which in part were reported at the meeting last year at Columbus, Ohio.

I have all the more confidence in the results which have been reported by Dr. Hayes, and in our own work, because the similar results have been obtained independently at widely separated experiment stations, and by the use of different diagnostic tests or checks in the investigational work. At the California station the "agglutination method" was almost exclusively employed, as indicated by the paper just read; while we at the Missouri station used the "complement fixation" method almost exclusively, although some phases of the work were checked by the agglutination method.

The work carried on at the two stations illustrates aptly the importance of different workers conducting investigations upon the same problem independently and concurrently. Accurate and conclusive results are thus more likely to be obtained, and more quickly. There will be agreement on most of the findings concerning facts and interpretations; and by conference and presentation of results, at meetings like this, the points of difference can be brought out, and each investigator can set himself anew to the work of harmonizing the differences in experimental findings and interpretations, by the addition of fuller data, or the correction of errors in previous work.

While the results which Dr. Hayes and his co-workers have obtained are in the main in accord with those which I and my research associates have found, there are a few points upon which we are not in agreement, but I am sure that further work will bring us into full accord on all essential points. The fundamental points upon which we now agree are these—that a specific infectious abortion disease exists among swine, and that the specific cause is the *Bacterium abortus* (Bang), or an organism very closely related to this microbe.

Before the comparatively recent work of these two stations, which was begun as emergency investigations of serious outbreaks of abortion in purebred herds of swine in the two States, the Bang abortion organism, as referred to by Dr. Hayes, had previously been isolated from aborted fetuses of swine in two instances, and its probable causative relation pointed out, first by Dr. J. Traum, who in 1914 isolated the organism from a swine fetus which had been sent for diagnosis to the pathological laboratory of the U. S. Bureau of Animal Industry. But beyond the laboratory cultural tests no further investigation of the organism seems to have been carried out at that time; and, unfortunately, the brief mention of the work, in the annual report of the department, was put under a heading relating to another swine ailment, and was not properly indexed. It was overlooked by subsequent investigators until attention was called to the matter recently by Dr. Traum. The discovery of the same organism by Professors Good and Smith, of the Kentucky Agricultural Experiment Station, in 1916, in an aborted swine fetus was entirely independent of previous work. These investigators, moreover, tested the pathogenicity of the organism for pregnant swine and thus added more conclusive evidence as to its causative relation to infectious abortion in swine. These conclusions the California and Missouri Experiment stations have more fully confirmed by their more extensive work, and by more rigid experimental tests. These stations, moreover, have added new facts of value concerning this disease in swine, and its relation to the infection in cattle.

It will not be necessary to dwell at length upon the points upon which we are all in close agreement, but simply to mention the more important ones in passing.

Concerning the cause, no one will claim that all abortions in swine are due to the *Bacterium abortus* (Bang). But I desire to emphasize

the opinion that the great majority of swine abortions, and especially those of an apparently infectious character, are due to this organism. Our own experimental studies, and numerous diagnostic tests of blood samples from suspected herds, confirm me in this opinion.

On the questions of sources of infection and modes of transmission in swine, I think we can safely regard the causative organism as an obligatory microbe which does not propagate outside the animal body under natural conditions, but requires special animal tissues for its perpetuation. The naturally infected tissues and fluids as pointed out in the paper of Dr. Hayes, are the aborted fetuses, the fetal membranes, the uterine discharges and the mammary gland, from all of which he has isolated the organism just as we have done in our work, with the exception that we did not attempt to isolate the organism from an emulsion of the mammary gland tissue of reacting sows. But we have made it a routine practice to investigate the colostrum milk of aborting or reacting sows on experiment, and to inoculate guinea-pigs with the milk samples, and test the colostrum serum for the specific abortion antibodies. The proof that the udder of abortion-infected swine harbors and discharges the *Bacterium abortus* (Bang) is thus easily demonstrated.

As to the modes of transmission under natural conditions, an important observation has been made both at the California and the Missouri experiment stations, namely, that unbred gilts may become reactors to the agglutination or to the complement-fixation tests for abortion antibodies, while exposed to aborting sows. This points to ingestion of infected materials as probably the principal mode of infection. To this I am able to add the evidence of artificial feeding of *Bacterium abortus* cultures to a non-pregnant sow which was followed by the development of the specific serological reaction (complement fixation).

Dr. Hayes' paper does not indicate any attempt to infect swine by feeding naturally infected materials, and his feeding of laboratory cultures, while inducing the specific agglutinating antibodies in the blood, did not produce abortion in the few animals that were fed. On these points, however, we have been a little more fortunate in our experimental work. The feeding of aborted pigs and membranes to non-reacting pregnant sows developed the specific abortion antibodies and was followed by abortion, and the *Bacterium abortus* was recovered from the infected experiment animals. Similar results were also obtained from feeding laboratory cultures from bovine and from porcine sources to pregnant swine.

As to the persistent retention of infection in mature swine shown by the data presented, this accords with observations made in our work by monthly tests of sows which have been on experiment since the autumn of 1919. Some naturally infected sows, however, are variable in their reaction to the complement fixation test, as is also shown to be true by Dr. Hayes concerning the reaction to the agglutination test. In our work, moreover, a few sows seem to have completely eliminated the infection. But the indications are that, as a rule, the aborting sow retains the infection permanently and will react persistently.

Concerning the transmission of the specific antibodies to the young pigs in utero or through the milk after their birth, we had about come to the same conclusion expressed by Dr. Hayes that such transmission was not probable. The difficulty of obtaining blood from the young pigs led us to defer the blood test until near weaning time. And in every case the blood serum was negative to the complement fixation test, just as the seventy-three pigs of positive reacting mothers were negative to the agglutination test, as reported by Dr.

Hayes. But as our work at so many points showed the swine infection to be identical with the bovine infection, I was not satisfied until we had made a fuller study, by testing the blood of the suckling pigs earlier. I instructed my laboratory associates to kill a few new-born pigs, if necessary, before they had suckled and others after they had suckled and test the blood serum. Fortunately a better plan was found—that of drawing the blood from the heart of the new-born pigs with a fine needle. A sufficient quantity for the tests can thus be obtained without serious hurt to the young pigs. It was found that the blood serum of a few pigs will react before the pig has suckled its reacting dam, but a larger number are negative. In all cases, however, the antibodies are found in the blood soon after the pig has suckled; and a retest at intervals shows the reaction is retained from a few weeks to several weeks, but that ultimately the antibodies and presumably the infection also is eliminated. A study of the colostrum shows it to be rich in the abortion reacting bodies (agglutinins and complement-fixing bodies), as well as the *B. abortus* organism. The young pig, however, like the young calf, seems to be able to destroy the infection, and the antibodies, and does not become reinfected as a rule unless re-exposed to "open infection" after sexual maturity. This gives added evidence of the identity or close kinship of the infection in the bovine and porcine species.

In the matter of the relation of abortion infection in swine to sterility and other conditions that affect breeding efficiency, Dr. Hayes is somewhat optimistic because observations show that some aborting sows, and in fact a rather large percentage, will conceive again, and some will rear large litters in spite of the retention of the infection. I confess to having shared in this hopefulness, but the more we study this matter the more serious it appears. The fact that a sow will conceive again after aborting, and while still carrying infection, is not the whole story. We must take into consideration the delays that occur in getting the sows with pig again, and also the small size of the litters that are farrowed by many of the infected sows. A regrouping of the animals in Table 2 according to age will bring out this point better. The reacting sows, several in number, which farrowed only from three to four pigs, I would classify as aborters, that is, some of the products of conception did not come to maturity. The term "partial aborter" would probably be more appropriate. In other cases the retention of septic matters following an abortion may cause permanent injuries to one horn of the uterus and render that portion sterile, while the other horn may remain functional. A *partial sterility* may thus be induced and result in small litters. The herds which I have had under observation furnish similar data resulting from the hurtful action of the *Bacterium abortus*, and its secondary or associated infections.

I wish to consider only a point or two in Table No. 3. A group of non-reactors, some of which farrowed several dead pigs as well as living pigs, and from one of which the *Bacterium abortus* was isolated, while others in this group farrowed healthy good-sized litters. I would suggest that it is probable that the non-reactors which farrowed good litters were not infected, while the probabilities are that all the non-reactors which farrowed some dead and some living pigs were carriers of abortion infection, but that at the time the tests were made the antigenic action may have been very weak and agglutinins may not have been present in sufficient amount to show the reaction. I would suggest that the colostrum serum be tested at farrowing time, and also that the complement fixation test be applied in these doubtful cases.

The studies which Dr. Hayes has made to determine the susceptibility of the testicular glands to invasion by the *Bacterium abortus*,

following artificial infection with cultures, recalls a study we made on a bull and a steer which were inoculated at the same time with the bovine abortion organisms. My prejudgment of the matter was that the bull would probably show a more persistent reaction than the steer, but monthly tests for more than a year showed that the steer retained antigenic substances much longer than the bull; and the thought that the testicular substance furnishes an especially appropriate medium for the growth of the *Bacterium abortus* in the living host may not be tenable, although this organ has, in some cases, been the seat of lesions due to the abortion bacillus. Taking the negative results shown by Dr. Hayes' work on the young boars, with that which we have carried out on the bull and steer, we may tentatively conclude that the testicle in fact may produce internal secretions which are antagonistic to the *Bacterium abortus*. A definite conclusion upon this matter cannot, however, be drawn from the observations made on the few animals under experiment.

The *Bacterium abortus* infection in swine is in my opinion a serious menace to the breeding efficiency of a herd, even though it does not show in the form of total abortion, and we should strive in every way possible to eradicate it from the herds. In this conclusion I am sure that Dr. Hayes and his co-workers agree with me. And I feel also that every one here will agree with me that the work presented is ample evidence that Dr. Hayes and his co-workers have a good grasp of the problems under consideration, and we hope they will continue their investigations, and that every other worker in this field will do the same, as opportunities permit.

### VETERINARY CHIROPRACTIC AGAIN

A Wisconsin physician reports the following incident to the *Journal of the American Medical Association*:

"A chiropractor was making regular calls at the home of a prosperous farmer to 'adjust' the farmer's wife. The farmer had a full-blood Holstein heifer fresh for the first time, and unfortunately the heifer gave milk from but two teats. To attend the heifer the farmer called a graduate veterinary surgeon, who had made two or three trips to the farm, but who had not succeeded in obtaining milk from the other two teats. The heifer was mentioned in presence of the chiropractor, who said, 'Let me see the heifer, I can fix her for you.' So, after adjusting the farmer's wife the chiropractor went to the barn, ran his fingers along the heifer's spine, and said, 'Here is the trouble, right here.' He secured a croquet ball and mallet, returned to the barn, placed the ball on the heifer's back and hit it with the mallet, assuring the farmer that the heifer would be all right now. The heifer never gave milk from the other two teats. The farmer tells the story, and thinks it a great joke that the chiropractor should attempt to adjust the heifer, but it has not yet dawned on the farmer that there is any joke in the chiropractor adjusting his wife."

## THE OCCURRENCE OF VIRULENT AND NONVIRULENT STRAINS OF THE HEMORRHAGIC SEPTICEMIA ORGANISM IN THE SAME ANIMAL<sup>1</sup>

By H. PRESTON HOSKINS

*Medical Research Laboratories, Parke, Davis & Company,  
Detroit, Michigan*

THE latter part of January, 1921, an opportunity was afforded to observe and study an outbreak of hemorrhagic septicemia in cattle on a farm near Clinton, Michigan. The disease had made its appearance among three carloads of calves, recently shipped from the Chicago stockyards, and was of the usual pulmonary type (so-called "stockyards pneumonia") seen in recently shipped animals. Upon our arrival at the farm several calves were already dead, a number were quite sick, and more than half of the others were showing some symptoms. The history and symptoms were sufficient to establish a clinical diagnosis of hemorrhagic septicemia of the pulmonary type, and autopsies held on the dead calves served to confirm the diagnosis. Tissues were taken from one of these calves, and the bacteriological findings in these tissues serve as the basis for this report.

Upon returning to the laboratory it was decided to confine the bacteriological examination to the sections of lung and muscle. The lung showed the usual catarrhal pneumonia found in these cases, and the muscle showed some hemorrhagic infiltration. The latter condition is not constant in the pulmonary type of hemorrhagic septicemia, but is quite frequently seen in the acute, septicemic form. It was decided to make direct cultures from the lung and muscle, as well as animal inoculations. Cultures were made from the exudate expressed from the bronchioles in the pneumonic areas of the lung and from the freshly cut surface of the hemorrhagic muscle, both of which had been removed and kept as free of contaminations as possible. For the animal inoculations emulsions were made of the lung and muscle in sterile physiologic saline solution. The larger particles were allowed to settle, and the relatively clear, supernatant liquid used for the inoculations.

It may be stated here that our reasons for making both direct

<sup>1</sup> Presented at the fifty-eighth annual meeting of the American Veterinary Medical Association, Denver, Colo., September 5-9, 1921.



cultures and animal inoculations were based on some previous experiences in which it appeared that animal inoculations alone had given erroneous results. On other occasions direct cultures without animal inoculations had been unsatisfactory. About 18 months previously, in an investigation of a reported outbreak of hemorrhagic septicemia among swine, we had isolated *Bacterium suissepticum* directly from the tissues, although emulsions of the same tissues had failed to infect laboratory animals. In this instance we examined material from six hogs in one herd, and isolated strains of *Bacterium suissepticum* from five of the six. Of these five strains only three were virulent for rabbits, and of these three only one was virulent for pigeons.

It might rightfully be assumed that animal inoculations would give more accurate results than cultures, so far as determining the presence of virulent hemorrhagic septicemia organisms is concerned. *Bacterium bovissepticum* has the reputation of being a rather elusive organism when attempts are made to isolate it directly from pathological material, even heart-blood, in which the organisms are sometimes quite numerous at death. On the other hand, rabbits are usually the animals of choice for inoculations, being very highly susceptible to hemorrhagic septicemia infections. However, the fact that rabbit septicemia exists among so many of the rabbitries throughout the country detracts from the value of these animals for diagnostic inoculation purposes at the present time.

It has happened more than once, in our investigations of hemorrhagic septicemia, now extending back over a period of five years, that rabbits have died following an inoculation with material known not to contain the hemorrhagic septicemia organism, and yet the heart-blood of the dead rabbits yielded the organism when cultured. It should be stated in this connection that these rabbits invariably showed some serious pathological alteration in the thoracic cavity, usually fibrinopurulent pleurisy and pericarditis, with some pneumonia.

Rabbits dying in 16 to 48 hours following an intravenous or a subcutaneous injection of a pure culture of the hemorrhagic septicemia organism rarely, if ever, show any pathological alterations in the thoracic cavity. Rabbits dying in even a longer time, up to 7 days after inoculation, may not show any lesions except petechial hemorrhages in certain organs and on serous

membranes. Table 1 gives the result of the inoculation of rabbits with emulsions of the tissues under examination.

TABLE 1.—ANIMAL INOCULATIONS WITH TISSUES

Rabbit No.	Date	Tissue	Amount	How	Result
1	Jan. 29, 1921	Lung	2 c. c.	Intravenously	Lived.
2	do.	Muscle	1 c. c.	Subcutaneously	Died, 24 hours.

The heart-blood of rabbit No. 2 yielded a pure culture of a small Gram-negative bacillus, producing a uniform, slight turbidity and slight, viscid sediment in plain bouillon, a moist grayish-white growth on ascitic agar, no change in litmus milk, no growth on potato, no gas in dextrose, lactose and saccharose fermentation tubes, with acid in the dextrose and saccharose but not the lactose bouillon. The organism was believed to be *Bacterium bovisепticum*.

#### DIRECT CULTURES

*Lung*.—From the exudate in the bronchioles, seeded on ascitic agar, was isolated a small, nonmotile, Gram-negative bacillus with cultural characteristics very similar to the organism isolated from the muscle by rabbit passage. This organism was planted in Hiss's dextrose, lactose and saccharose serum-water medium instead of fermentation tubes. There was no gas production, but acid in the dextrose and saccharose tubes. Cultures in plain bouillon soon flocculated to the bottom of the tube, leaving the supernatant fluid nearly clear. This organism was believed to be *Bacterium bovisепticum*.

*Muscle*.—This tissue proved to be contaminated, but by plating on ascitic agar, using the method described by Klix (1), an organism was obtained that corresponded with the foregoing, morphologically and culturally, and was believed to be *Bacterium bovisепticum*. The bouillon cultures, however, appeared to grow more heavily and did not clear up like the cultures of the lung strain.

*Summary*.—From the lung and muscle by direct cultures, and from the muscle by rabbit passage, three separate cultures were secured, all apparently alike and corresponding to *Bacterium bovisепticum*. No particular attention was paid, at this time, to the difference noted in the bouillon cultures of the lung and muscle strains, as practically the same difference had been

noted many times in working with a single strain planted in different batches of culture media. In fact we have demonstrated, in some unpublished experiments, that we can control the character of the growth in bouillon by altering the composition of the medium. These differences include sediment, turbidity and surface growth.

Having isolated the organism from the lung, but having failed to kill a rabbit with an emulsion of the lung tissue, the question was raised as to the virulence of the lung strain. To determine this, rabbit inoculations were resorted to, using cultures obtained directly from the lung (LD), directly from the muscle (MD) and from the muscle through rabbit passage (MR).

TABLE 2.—TESTS OF VIRULENCE OF THE THREE STRAINS

Rabbit No.	Weight (Grams)	Con- dition <sup>1</sup>	Date	Culture	Amount (c.c.)	Result.
3	2,730	Used	Feb. 25, 1921	LD	0.0001	Lived.
4	2,100	Normal	do.	do.	.0001	
			Mar. 2, 1921	do.	.001	
			Mar. 7, 1921	do.	.005	
			Mar. 14, 1921	do.	.1	Died 22 hours.
			April 5, 1921	712	.0061	
5	2,240	do.	do.	712	.0001	do.
6	3,000	Used	Mar. 14, 1921	LD	.1	Lived.
			April 5, 1921	do.	.001	
7	2,420	Normal	do.	do.	.001	do.
8	3,040	Used	Feb. 25, 1921	MD	.0001	do.
9	2,100	Normal	do.	do.	.0001	do.
			Mar. 2, 1921	do.	.001	Died, 48 hours.
10	2,240	do.	do.	do.	.001	Died, 19 hours.
11	1,840	Used	April 5, 1921	do.	.001	Died, 22 hours.
12	2,200	Normal	do.	do.	.001	do.
13	3,700	Used	Mar. 23, 1921	MR	.001	Died, 6 days.
14	3,000	Normal	do.	do.	.001	Died, 24 hours.
15	2,360	Used	April 5, 1921	do.	.001	Died, 22 hours.
16	2,900	Normal	do.	do.	.001	Died, 23 hours.

<sup>1</sup> Rabbits designated as "used" had received one or more previous injections of hemorrhagic septicemia organisms and were used in these experiments for the purpose of noting any degree of immunity conferred by these injections. Such rabbits were generally used in pairs, one normal and one "used," and in only one instance (rabbit No. 13) did the "used" rabbit show any appreciable resistance above that shown by the normal rabbit.

#### DISCUSSION OF THE VIRULENCE TESTS

Rabbits (Nos. 3-7) injected intravenously with varying amounts (0.1 to 0.0001 c.c.) of 24-hour bouillon cultures of the strain isolated directly from the lung, in single or repeated doses, failed to succumb. The doses injected were many times the dose of a virulent culture necessary to kill rabbits. Four injections, at about weekly intervals, failed to immunize a rabbit (No. 4) against a virulent strain of *Bacterium bovissepticum* (No. 712), the rabbit dying as soon as the normal control (No. 5).

In the case of the strain isolated directly from the muscle (MD) all rabbits receiving a dose of 0.001 c.c. of a 24-hour bouillon culture died promptly. Two rabbits resisted a dose of 0.0001 c.c. One of these (No. 8) had been used in a previous experiment, and may have been partially immune. The injection of the same amount in a normal rabbit (No. 9) failed to kill, and when this rabbit was given a second injection five days later, it did not die until 48 hours later, the control (No. 10) dying in 19 hours. This might be interpreted as due to a slight immunity resulting from the first injection, or to some natural immunity.

The strain isolated from the muscle through rabbit passage (MR) killed consistently in doses of 0.001 c.c. One used rabbit (No. 13) showed sufficient resistance to withstand a killing dose for over 5 days, sickening and dying on the sixth day. The minimum fatal dose of the culture was not determined.

From these few experiments we came to the conclusion that we had been successful in isolating both a virulent and a non-virulent hemorrhagic septicemia organism from the same animal, the virulent type from the muscle and the nonvirulent type from the lung. So far as determined these were typical strains of *Bacterium bovisepiticum*, and identical so far as cultural and morphological characteristics were concerned, with the exception of the growth in bouillon as previously noted.

Nonvirulent organisms indistinguishable from members of the hemorrhagic septicemia group have been isolated from the respiratory tract of various animals (calves, hogs, rabbits) by the present writer on previous occasions. Others have reported similar findings. Likewise, the present writer has isolated virulent hemorrhagic septicemia organisms from the lung, heart muscle or blood of animals dying of clinical hemorrhagic septicemia (calves, sheep, hogs, rabbits). This instance, however, is the first where both virulent and nonvirulent organisms have been recovered from the same animal. It is quite likely, however, that nonvirulent organisms have failed to receive recognition when virulent varieties were present to overshadow them.

#### PREVIOUS OBSERVATIONS

In a paper (2) read before the Missouri Valley Veterinary Association two years ago, I made the following statement:

"It would appear from an examination of a large number of strains of these (hemorrhagic septicemia) organisms that there

are minor cultural differences between these strains, although certain morphologic and physiologic properties seem to be firmly fixed. There are also slight differences serologically. These suggest the possibility of there being a number of types of the organism, just as we have the different types of the pneumococcus or the dysentery bacillus. Whether it will be possible to correlate these differences with any important pathogenic properties will be revealed by future investigations."

Manninger (3) has observed the coexistence of virulent and nonvirulent fowl-cholera organisms (*Bacterium avisepticum*) in 6-months-old bouillon cultures, his attention being drawn to them when transfers were made to agar and two types of colonies developing on this medium. When the two types were separately replanted in bouillon, they showed a marked difference, especially in the character of the sediment. The two types cross-agglutinated.

In a recent publication De Kruif (4) has reported some observations on the coexistence of individuals of different degrees of virulence in cultures of the bacillus of rabbit septicemia, isolated from spontaneous infections occurring among the normal animal stock in the laboratories of the Rockefeller Institute. Cultures were made from the heart-blood in 10 per cent defibrinated rabbit-blood broth, incubated for 24 hours, and then plated out in 5 per cent rabbit-serum agar. Colonies were fished to rabbit-serum broth, incubated and examined, then streaked on 10 per cent rabbit-serum agar, these cultures being kept for study.

In a series of well-executed experiments De Kruif has been able to isolate two types of organisms from these cultures of the rabbit septicemia organism. These types have several points of difference culturally (bouillon growth and agar colonies), and there is a wide difference between the degrees of virulence for rabbits. These differences may be summarized as follows:

TABLE 3.—DIFFERENCES BETWEEN TYPES DESCRIBED BY DE KRUIF

	Type D	Type G
Bouillon (plain or serum)	Diffuse	Granular (floculates readily)
Agar (serum)	Opaque, fluorescing colonies	Translucent, bluish nonfluorescing
Virulence for rabbits	High	Low

The two types of organisms are morphologically indistinguishable and possess identical fermentation reactions. Rabbits sur-



living inoculation with Type G are later found to be able to withstand multiple lethal doses of Type D. Agglutination and absorption tests strongly suggest the antigenic identity of the two organisms.

Careful reading of De Kruif's report leaves somewhat in doubt the exact origin of the two types. The original heart-blood cultures were plated out and the cultures from which he subsequently separated the two types were descendents of single colonies. Yet, after another plating, he was able to get the two types, and these, once separated, appeared to retain perfectly their characteristics of cultural growth and virulence. Having read the publication of De Kruif, it is perfectly natural to attempt some explanation of his findings, or to reconcile our observations with those of De Kruif.

As previously stated, various animals, especially rabbits, frequently harbor hemorrhagic septicemia organisms in some part of the respiratory tract. The heart-blood of rabbits in apparent health, bled for culture medium purposes, has been found to contain hemorrhagic septicemia organisms. Whether these have been caused to enter the blood-stream, at death, in a mechanical way, incident to the bleeding process, or whether the blood stream harbors a few organisms from time to time, can not be stated definitely.

Animals harboring hemorrhagic septicemia organisms are not necessarily immune to artificial infection with virulent strains of the same organism, as shown by Davis (5). This is not always true, however, of rabbits having subcutaneous abscesses caused by local infections with the rabbit septicemia bacillus. Many of these animals exhibit considerable immunity to artificial infection.

With these facts in mind, and with the knowledge that the blood stream may harbor simultaneously two organisms, not necessarily related, it seems easily possible that in a terminal infection, as in rabbit septicemia, we might have two organisms, in this case closely related, in the blood stream at the same time.

In the case of the calf dead of hemorrhagic septicemia, reported in this article, we have shown that the animal had in its system, simultaneously, at death, both a virulent and a non-virulent hemorrhagic septicemia organism. The blood was not cultured, but it is quite likely that it contained the virulent strain, and we can not say that it did not contain the nonviru-

lent strain. Neither can we say that the muscle, from which the virulent strain was isolated, did not contain the nonvirulent strain. By the time that it was apparent that we had the two strains, the original material had been discarded.

These findings tend to complicate, for the time being, at least, our views on the etiological significance of the hemorrhagic septicemia organisms and their bearing on immunological reactions. May the presence of hemorrhagic septicemia organisms of a low virulence stimulate the production of antibodies sufficient to protect the host against infection with a virulent epizootic strain, or may it have just the opposite effect, namely, that of sensitizing the animal and rendering it more susceptible?

Can a nonvirulent strain, such as was isolated from the lung of the calf, undergo mutation and become virulent? The writer has been able to change, at will, the character of the growth, in bouillon, of a virulent culture of *Bacterium bovissepticum*, by simply altering the composition of the medium. Future experiments may show that we can alter the virulence in the same way.

We have reason to believe that alterations in virulence do take place under natural conditions. In fact, our present views on the nature of the disease are based on that assumption. Some strains of the hemorrhagic septicemia organism retain indefinitely their virulence for laboratory animals. Others become avirulent in a comparatively short length of time. To restore virulent properties to a strain that has become avirulent is a difficult task, with our present knowledge. The demonstration that organisms of low virulence suddenly become exalted in the animal body is even more difficult.

#### REFERENCES

1. KLIX, H. C. A simple method of isolating bacteria from pathological material. Jour. Lab. and Clin. Med., vol. 6 (1920), No. 2, p. 104.
2. HOSKINS, H. P. Some considerations of the hemorrhagic septicemia group. Proc. Mo. Valley Vet. Assoc., 1919. (In preparation.)
3. MANNINGER, R. Ueber eine Mutation des Geflugel-cholera-bazillus. Centbl. Bakt., etc., I, vol. 83 (1919), p. 520. (Abst. in Bul. Inst. Pasteur, vol. 18 (1920), No. 10, p. 330).
4. DE KRUIP, P. H. Dissociation of microbic species. I. Coexistence of individuals of different degrees of virulence in cultures of the bacillus of rabbit septicemia. Jour. Expt. Med., vol. 33 (1921), No. 6, pp. 773-789.
5. DAVIS, D. J. Further observations on subcutaneous abscesses in rabbits. The carrier state and its relation to rabbit septicemia. Jour. Infect. Diseases, vol. 21 (1917), No. 3, pp. 314-321.

## CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

### PATHOGENIC EFFECTS OF CAPILLARIA WORMS ON CHICKENS

By E. L. STUBBS and HOWARD CRAWLEY

Philadelphia, Pa.

ON September 6, 1921, three White Wyandotte chickens, three months old, were brought to the laboratory of the Bureau of Animal Industry, Pennsylvania Department of Agriculture, for examination. The owner is a breeder of high-class birds and has a flock of 175, at that time consisting of 50 adult hens, 50 pullets and 75 young chickens. He was having no trouble with the hens or pullets, the infection being confined to the younger members of the flock. At the time given, three or four had died, and nine others were affected.

The symptoms were droopiness, slight diarrhea and progressive emaciation, this condition terminating in death after about a week. The flock was being fed plenty of greens, boiled oats, all the mash they wanted, and grain at night.

At autopsy all three of the birds received at the laboratory showed a chronic proliferative enteritis, which was very severe in one of the three, the intestinal walls being greatly thickened. This condition extended from the gizzard almost to the rectum. Microscopical examination of scrapings of the mucous membrane and the contents of the intestinal lumen showed numerous nematodes. These were of two species (*Heterakis vesicularis* and *Capillaria* sp.). The former worm is normally a parasite of the caeca, and is said to measure 7 to 13 mm. for the males, and 10 to 15 mm. for the females.

In the case of the most badly affected chicken, however, the *Heterakis* worms were present throughout the entire length of the intestine. Further, while morphologically identical to *H. vesicularis*, they were small for this species. The males ranged from 4.0 to 5.4 mm. long, and a mature female, as evidenced by the presence of eggs, was but 7.2 mm. long. An immature female gave a length of 4.6 mm.

While these worms probably aided in bringing about the con-

dition described, the greater blame must be placed on the *Capillaria*. The female of this form varied from 11 to 13 mm. long and the eggs measured 45 to 25 microns. The males were somewhat smaller. The genus *Capillaria* has recently been separated from *Trichosomum*, and is made up of worms the posterior ends of which are but slightly thicker than the anterior, whereas in *Trichosomum* the posterior ends are much thicker. All of these so-called whipworms have the habit of attaching themselves to the mucous membrane of the alimentary canal, the result of which is profound irritation and the secretion of a large quantity of mucus. In consequence the group is distinctly pathogenic.

The literature does not permit of a positive determination of the species of the worm found. Travassas (Memorias do Instituto Oswaldo Cruz, vol. 7, pp. 146-172, 1917) gives two species of *Capillaria* as present in domesticated chickens, *C. retusa* and *C. strumosa*. These are separated according to the relative lengths of the narrow and broad portions. This, however, is not a particularly good character, for the worms taper rather regularly, and it is not at all easy to say where the narrow part ends and the broad part begins. This same author gives the following figures for the size of the eggs: *C. retusa*, 56-60 by 28-32 microns; *C. strumosa*, 60 by 25 microns.

As already mentioned, the eggs of the worm, under consideration measured 45 by 25 microns. It is possible, therefore, that it is a new species, but a more extended study than has yet been made would be necessary in order to determine this point.

The observation, however, is considered worthy of record, owing to the undoubted pathogenicity of the worm to chickens. It is probably also commoner than is generally supposed, since its position close up against the mucous membrane and embedded in mucus allows it to be overlooked unless a careful search is made.

---

Dr. H. B. Wilkerson, of Bedford, Va., writes that he has had excellent results in the treatment of cerebrospinal meningitis in horses by the use of fluid extract of aconite. A dose of 5 minims per 100 pounds body weight is given every 3 hours. The treatment is continued until the symptoms of delirium disappear.

## ABSTRACTS

---

THE SO-CALLED BOTRYOMYCOSIS IN MAN. G. Romano. Tumori (Rome), vol. 8, p. 129, Aug. 10, 1921. (Abst. in Jour. Amer. Med. Assoc., vol. 77, p. 1139, Oct. 1, 1921.)

Romano's deductions from three cases personally observed and from the scanty literature on botryomycomas are that there is no identity between the disease in man and in horses. Even those with the most experience are dubious whether to class the nodule as a neoplasm or a granuloma, and the term "human botryomycosis" is misleading.

---

TUBERCULOSIS IMMUNIZING VACCINE. N. Raw. Brit. Med. Jour., 1921, No. 3147, p. 594. Abs. in Amer. Rev. of Tuberc., vol. 5 (1921), p. 119.

Since 1906 human, bovine and avian tubercle bacilli have been subcultured by the author every month. The present growths represent the 184th generation. The growths are still luxuriant and true to type, but they do not produce tubercles and are completely nonpathogenic to animals. The pathogenicity has been tested every year. No change was noted until the 94th generation. After that time attenuation became marked, and after a year or two the cultures were avirulent. Treatment of disease by vaccines prepared from attenuated organisms naturally means that the production of antibodies will take place rapidly without any preliminary shock to the system, such as invariably follows the injection of vaccines prepared from virulent strains of bacteria. With a view to elucidating the real amount of tuberculosis in man caused by the human and bovine types of bacilli, and also as to immunity produced by one infection toward the other, Raw instituted clinical observation on a large scale in a Liverpool hospital of 900 beds, of which he had charge for eighteen years. In no case of primary pulmonary tuberculosis did he observe, during the course of the illness, tuberculosis of bones, joints, glands or skin, nor any instance of meningitis. Among the surgical cases of tuberculosis, 28 developed lung symptoms and 25 died. In all cases the infection of the lung was either by direct extension from cervical lymph nodes to the apex of the lung, or from a primary focus



in the abdomen extending upward through the diaphragm to the bronchial nodes and lungs. This large clinical experiment convinced Raw that the human body is attacked by two quite distinct forms of tuberculosis: the one conveyed from person to person by direct infection and attacking chiefly the lungs, and the other conveyed by milk from tuberculous cows, and developed in the first few years of life. These two diseases are caused by different types of tubercle bacilli which will not live in the body at the same time; and one disease produces immunity to the other. Hence, Raw always uses a vaccine prepared from bovine cultures in the treatment of the human infections and vice versa. The vaccine which he has had prepared from his attenuated cultures is an emulsion of the bacilli, and contains all the products of the bacillus. It is nontoxic and avirulent, and produces no reaction even in large doses. For purposes of immunization in susceptible children 6 injections are given at weekly intervals. This course is repeated in 3 months. The doses recommended are 0.001, 0.002, 0.003, 0.004, 0.005, 0.006 mgm. No symptoms have been observed to follow these injections. In the treatment of the active disease the doses are much larger than have been possible up to now. At least 12 injections should be given at intervals of seven days in doses increasing from 0.001 to a maximum of 0.025 mgm. The vaccine should be freshly prepared from the cultures and should not be used after one month. It can be used with complete safety in any stage of the disease, and even in advanced cases great relief from night sweats and toxic symptoms have been noted. The results in suitable cases are excellent. Raw has succeeded in immunizing completely highly susceptible animals by the use of attenuated cultures, and he firmly believes that if all children with a tuberculous history could be safely vaccinated in the manner described they would be placed in a better position to resist infection at home.

---

RESEARCHES ON INFECTIOUS ABORTION IN MARES. M. Carpano.  
Ann. Ig. (Rome), 29 (1919), No. 11, pp. 752-779. Abs. in  
Exp. Stat. Rec., vol. 45 (1921), p. 179.

The author reviews the literature on infectious abortion in mares and joint-ill or arthritis in foals and reports the results of his study of this disease in Italy, where abortions in mares,

particularly the imported stock, are quite common and the foals born alive in localities where abortions have occurred are often affected with polyarthritis.

Two microorganisms have been isolated from pathological cases, *Bacillus abortus equi* and a micrococcus of the type of *Streptococcus equi*, the former being considered the causative agent. The characteristics of these organisms are described and successful experiments are reported on the diagnosis of the disease by serum agglutination and on the therapeutic and prophylactic treatment of the disease with a mixed polyvalent serum.

---

AN EPIZOOTIC OF FOWL TYPHOID IN FRANCE. F. d'Herelle.  
Rev. Gén. Méd. Vét., 29 (1920), No. 339, pp. 128-130. Abs.  
in Exp. Stat. Rec., vol. 45 (1921), p. 181.

The loss occasioned during a series of widespread outbreaks of disease among poultry in France was in a great majority of cases due to fowl typhoid (*Bacterium sanguinarum*), the existence of which had not previously been reported in that country. It is said that in certain places there occurs in coexistence with fowl typhoid another disease of undetermined etiology which causes a high mortality among fowl and geese, the latter of which are not susceptible to fowl typhoid.

---

IMMUNIZATION AGAINST BLACKLEG WITH GERM-FREE FILTRATES.  
E. Gräub and W. Zschokke. Schweiz. Arch. Tierheilk., 62  
(1920), Nos. 2, pp. 52-65; 3, pp. 112-122. Abs. in Exp. Stat.  
Rec., vol. 45 (1921), p. 180.

From a series of experiments on the immunization of guinea pigs, sheep, and cattle against blackleg, the authors conclude that a single subcutaneous injection of blackleg filtrate produces an immunity which protects the animals against double the ordinary fatal dose of virulent blackleg material. A second inoculation with attenuated virus which is not fatal to normal animals, but in itself produces only slight immunity, greatly increases the immunity produced by the filtrate. It is considered that the immunity is not only active and lasting against the strain used for the preparation of the filtrate but against other strains as well.

In practice, the single immunization with blackleg filtrate is recommended for cattle which are exposed to blackleg infection only during the pasture season and the double method for animals continually exposed to infection. Inoculation with the virus should be given not earlier than 10 days nor later than two months after the filtrate inoculation.

---

EXPERIMENTS CONCERNING THE ACTION OF COLD ON THE BODY.

D. Schade. München. Med. Wehnschr., 1919, p. 301.

Regarding the influence of cold on the body, three effects are discernible: (1) The harmful action through colloidal tissue change in the cells. The injurious effects on the vitality of the cell consist in a change in the normal colloidal condition of the cell protoplasm, through which the colloidal protoplasm disappears (vacuolizing degeneration).

(2) The remote effects of cold which are particularly reflex in character, proceed from the sympathetic nervous system (changes in the distribution of blood to the internal organs, muscular contractions, muscular flaccidity, anomaly of secretion of the internal glands, for example, the kidneys).

(3) Lowering of immunity. Experiments conducted on animals exposed to intense cold out of doors, proved that such animals possessed a lessened resistance to various infecting agents.

J. P. O'LEARY.

---

CONCERNING THE NATURE OF NECROTIZING PNEUMONIA IN SWINE

PLAGUE AND HOG CHOLERA. Muller and Schmid. München. Tierarztl. Wehnscher., 1920, p. 274.

The authors do not share in the view that swine plague has changed its nature in the course of the year and that the classical necrotizing form proceeds from the same cause as the chronic catarrhal form. They are of the opinion that the classical necrotizing form of swine plague is by no means a particular infection, but rather the pectoral form of acute virus pest (hog cholera).

## ARMY VETERINARY SERVICE

### THE PERCHERON AS AN ARMY HORSE

Major Gen. Sir John Moore, Director of the British Army Veterinary Services in France, has written an excellent book on "Army Veterinary Service in War." From this book the following paragraphs are taken:

#### AMERICAN HEAVY DRAUGHT HORSES

Though not so weighty and powerful as our best English heavy draughts, the American Percheron or crossed Percheron on the whole gave great satisfaction and was universally liked during the war in France. He teams well, is active, has a good constitution, is a good doer, and has good, sound legs and feet. The absence of hair on the legs was a great asset in comparison to our English heavies under the muddy circumstances of winter in the forward areas. He is best described as a medium heavy, and as such he is quite big enough for the heavy draught purposes of war. As a draught animal I do not consider him in any way superior to our English Shire or Clydesdale, or to the smaller of these breeds of which he may be considered a parallel; but there is no doubt that in war he can be more generally placed, and can stand hardships better than our heavy breeds. Whether or not his relatively satisfactory service in France was due in part to a return to the country of his ancestors can only be surmised. He certainly stood the climate very well. He shipped to the country on the whole well, and suffered less from serious respiratory sickness on landing than the heavy Shires and Clydesdales. At the same time it must be remembered, as I have previously remarked, that respiratory sickness is preferable to infection, and in all classes of animals incidents of this form of disease were very greatly reduced by the rigid taking of temperatures on landing and previous to drafting to units. Moreover, the heavy mortality experienced amongst Shires and Clydesdales was during the first winter of the war, when they were practically without shelter of any kind and subjected to incessant rain—a very different state of affairs to the ample and good accommodation provided by such times as American shipments of heavy animals commenced.

An idea of utility may be gathered from the records of one veterinary hospital in France, at which out of 120 heavy draught horses cast and sold in two years, 116 were British (the

officer commanding was unable to differentiate Clydesdale from Shire) and four only were American.

In another veterinary hospital, a committee of officers, Royal Army Veterinary Corps, drew attention to the fact that a fairly large percentage of heavy draught American horses had side-bones, but expressed the opinion that this defect could soon be bred out by careful selection of sires; in like manner to its exclusion in our English breeds following a more particular classification of the defect as an unsoundness.

#### MULES

In animal kind, the hero of the late World's War—as in all other wars in which he has participated—that paragon of excellence, the mule, finds the premier place. He stands out prominently as a first-class war animal, and under all circumstances, in all climates or situations, whether amongst the mud of France, in the deserts of Egypt, on the plains of India, or on the hill-tops of the Himalayas, in burning heat or icy snow, his achievements have been marvelous. He is as indispensable to war as a commander of the forces, and no history of war is complete without him. Any demerits he may possess are attributable to a psychology peculiarly his own, but his merits are double distilled, and little more remains to be said on that account.

#### AMERICAN MULES

Of all countries in the world, none can surpass the United States of America for the production of mules, nor compete with it in general resources. The mule population of the States amounts to nearly 3,000,000, and the fountain never seems to run dry. During the South African war, the British government purchased 80,524, and though I have no actual figures to guide me, I should say purchases during the late war amounted to considerably over a quarter of a million. The strength of mules in the British Expeditionary Force, France, alone amounted to roughly 90,000.

All sorts and sizes of mules are bred in the United States, from the small miner 12-3 or 13-0 to the magnificent sugar mule 16-2 and over. It pays better to breed a mule than a horse, and the market is for mining, lumber trade, and the cotton and sugar industries of the South. The real home of the American mule, and especially the large mule, is Missouri, though lighter mules are raised in Texas. If the magic names of Lathrop, Missouri and Kansas City are whispered into the long ear of



an American mule, he will immediately start a conversation about his old home, blue grass, Indian corn shucks and stover, his fine big mother, his French and Spanish ancestry on his father's side, and he will air his views on stockyards and "niggers" generally. The American mule is wonderfully docile, and to my mind, quite the most handsome creature of the genus *Equidae*, and lovable withal. His power is best appreciated by standing close up to him: at a distance he may look mean.

As a rider, a mule is of little value, a supreme will and an iron mouth, as a rule, prove the drawback.

\* \* \* Their happy nature goes a long way towards their success. They have a habit of worming their way into the hearts of our soldiers, and very soon friendly relations are established that work for the common good. Their endurance, their comparative freedom from sickness, their pluck and stout heartedness when properly treated, their ability to perform work under adverse circumstances and when short commons are necessitated, are their usual attributes; and their employment in war is a great economic factor. These remarks stand for all mules, whether American or otherwise.

The majority of American mules employed in the various theatres of war were for light draught purposes, supplying the place of light draught horses in ammunition columns, etc., of formations, and receiving the same rations as light draught horses. To the latter factor the superiority of the mule over the light draught horse is greatly ascribed. If well fed, he thrives on work, and in times of idleness he will quickly get fat. As an instance of ability to stand the vicissitudes of campaign I will quote again the Somme operations in 1916. This offensive period resulted in 16,074 debility (poor condition) cases evacuated to veterinary hospitals on lines of communications, of which total only 404 were mules. The percentage of inefficiency was 4.42 for horses and 0.61 for mules; horses suffered, therefore, seven times more than mules. During the winter seasons they gave us far less trouble than horses (1 to 3, about) from skin disease, and respiratory disease was practically nil. These are very strong arguments in favor of the mule. I call to mind the limbered general service wagon mules of the 17th Lancers going through the streets of Abbeville on a snowy day. They were pictures of health, and the bloom of their coats shone in spite of the snow. It is only one instance of many, and it made one feel proud to belong to our army.

## ASSOCIATION NEWS

### AMERICAN VETERINARY MEDICAL ASSOCIATION

#### Proceedings of Fifty-Eighth Annual Meeting, Denver, Colo., September 5 to 9, 1921

*(Continued from December JOURNAL)*

THURSDAY AFTERNOON, SEPTEMBER 8, 1921

#### GENERAL SESSION

The meeting convened at 1:30 p. m., President David S. White presiding.

#### REPORT OF AUDIT COMMITTEE

PRESIDENT WHITE: The first item of business will be the reports of committees. Is the Audit Committee ready to report?

(Dr. H. Preston Hoskins read the report of the Audit Committee, as follows:)

Your committee begs to report that we have examined the accounts of the Treasurer, Dr. Jacob, and a careful audit of his receipts and disbursements shows these to be correct.

The books of the Secretary, Dr. Mayo, have received a very thorough audit at our hands, and the accounts have been found to be correct.

The accounts of the JOURNAL, in the hands of the Editor, Dr. Mohler, were not audited by your committee, these having previously been examined by an accountant as provided by the Constitution and By-Laws.

Your committee asks to be allowed to make several recommendations:

1. There appears to be no valid reason for requiring the accounts of the Editor to be examined by a qualified accountant (see paragraph M of Section 7 of Article V of the Constitution), while this is not required of the Secretary or the Treasurer.

Article 17 of the By-Laws provides for an Auditing Committee, but attention is directed to the fact that the personnel of this committee may be completely changed from year to year, and a committee may not have a single experienced member on its personnel. The five members are usually widely distributed geographically and do not have an opportunity to examine the various books and accounts until the annual convention, when the time of the committeemen is often at a premium, a considerable amount of time being required for a careful audit.

In view of the fact that the Association has a fiscal year, it would appear that the proposed audits might properly be made at the end of each fiscal year.

2. Your committee would also direct attention to the heavy financial loss being sustained at the present time by the Association, in connection with the remittance from Canadian members for initiation fees and dues. It would appear that this loss, in connection with the present difference in exchange, runs well over one hundred dollars per year. This loss could be naturally reduced, we believe, by having

the Treasurer maintain a Canadian depository until such time as exchange rates return to normal. Canadian banks are at present paying 5½ per cent interest on time deposits, and if necessary the funds on time deposit in the United States could be reduced an amount equal to that being kept on deposit in Canada.

H. PRESTON HOSKINS, *Chairman,*

R. H. MARSTELLER,

H. E. BEMIS,

*Auditing Committee.*

(It was voted, on motion of Dr. Fitch, seconded by Dr. Hilton, that the report be received.)

#### REPORT OF EXECUTIVE BOARD

PRESIDENT WHITE: Has the Executive Board a report to make?

DR. HILTON: At the last annual session this Association referred to the Executive Board the question of considering whether or not the positions of Secretary, Editor and Business Manager should be combined. The Executive Board, in order to look into that matter very closely, appointed a subcommittee of the Board. This subcommittee has been looking into the question from every angle during the past year, and it has reported to the Executive Board, which has accepted the recommendations of the subcommittee.

In looking over the situation with regard to the appointment of a permanent officer for these positions the Executive Board has also to consider our financial status. From the report of the Treasurer you will note that we are only just balancing ourselves. We are going to draw on our capital account, and the Executive Board is of the opinion that before a position of this kind is made permanent our capital account should pay sufficient revenue to pay a greater portion of our operation expenses. Our Treasurer has at the present time, as you will note in his report, money invested in bonds, also money on time deposit. We are endeavoring to get as much of that money invested in bonds as possible, so we can increase the interest on our principal.

It is therefore recommended by the Executive Board that, in view of the facts which I have outlined, the officers be maintained for the coming year as in the past, and the Executive Board therefore recommends that the present incumbents of these positions, Dr. Mayo, the Secretary, and Dr. Mohler, the Editor and Business Manager of the JOURNAL, be maintained at the same remuneration as last year for the coming period.

The Executive Board also wants to recommend an amendment to the Constitution, but I think it is very important that before this notice is given you clearly understand the object of the Executive Board in recommending this amendment. Under the present Constitution it is one of the duties of the Executive Board to recommend to this Association yearly the appoint-

ment of a Secretary, Editor and Business Manager. In the work of the Executive Board during the past year it was found that so long as the Constitution required the Executive Board to recommend the appointment to these positions each year, and until the Association is in a position to make those positions permanent, they will experience a great deal of difficulty in getting anyone to consider accepting such a position.

We don't know when the Association will be in a position to take such action. We are making an extra campaign during the coming season. We have organized to try to increase our membership. At the present time, before this meeting opened, we had but 4,000 active paying members. We have taken in 225 new members, but there have been some resignations, so we may reckon upon approximately 4,000 paying membership. We want to double that; we have to double that if we are going to extend and become permanent, and for that reason we are making a special effort to get new members.

I thought it well to enlarge on that, so that no member of this Association would think that the Executive Board had something that it didn't want you to understand. That is the only reason. Under the Constitution as it stands at present a person appointed to either of those positions or the combined position may be recommended yearly, but you can be sure if he is an individual capable of filling those combined positions he naturally asks what are the chances regarding his permanency, and he sees the Constitution and sees that the Executive Board has to report every year and recommend individuals for those positions.

The Executive Board therefore recommends that paragraph L of section 7 of the Constitution be amended by eliminating the word "yearly." If the recommendation is accepted, it will have to be laid on the table until next year before it becomes operative.

DR. ELLASON: As I understand, the proposed amendment was to be incorporated as read by Dr. Hilton, at this time.

DR. HILTON: The amendment is just to remove the word "yearly" from that section.

DR. ELLASON: Wouldn't it appear to you that there also might be a provision as to how long they are to remain in office? Where it is a definite appointment there ought to be some agency for removal.

DR. HILTON: There are. The Constitution provides that any of those individuals can be removed from office if necessary, provided it is recommended by the Executive Board and approved by the general session.

PRESIDENT WHITE: This is simply received at this time and will be acted upon at the next meeting.

DR. JENSEN: It appears to me that this body has nothing whatever to do with the secretaryship. No change could be made

unless the Executive Board recommends it first, and then we can have a second whack at it. I am very much opposed to such a proposition as that.

DR. CARY: I move that the report be accepted and the amendment be referred to the Executive Board for action next year.

(The motion was seconded by Dr. Dimock and carried.)

SECRETARY MAYO: The following applications have been favorably recommended by the Executive Board:

C. B. Carpenter, Ithaca, N. Y.

Pedro de Guia, Manila, P. I.

J. B. Morales, Manila, P. I.

Paulina M. Vytiacho, Manila, P. I.

H. H. Sheeler, Buhl, Idaho.

W. M. McLeod, Manhattan, Kans.

Thomas Sims, Hutchinson, Kans.

Stephen H. Hopkins, Kans.

William Harvard, St. Augustine, Fla.

The Board also recommends that the application of Dr. Herminio Bernas, Iloilo, Philippine Islands, be accepted under suspension of rules. He is a graduate of San Francisco Veterinary College in the year 1918. The college has been dropped previously, but as it has been out of existence, and is out of existence at this time, they recommend that his application be accepted.

DR. HOSKINS: I move that the report of the Executive Board be received and that under suspension of the rules the applicants whose names have been read be admitted to membership by vote of the Association.

(The motion was seconded by Dr. Dimock and carried.)

DR. CONNAWAY: I move that the rules be suspended and Dr. Bernas be elected to membership.

(The motion was seconded by Dr. Hoskins and carried.)

SECRETARY MAYO: The Executive Board recommends that Dr. J. W. Buchanan, of Union, S. C., be expelled from the Association for violation of the Code of Ethics.

DR. HOSKINS: I move that the recommendation of the Executive Board be received and approved by the Association.

(The motion was seconded by Dr. Goss.)

DR. CONNAWAY: Some of the men around me seem to want to know what are the circumstances. We wouldn't like to cut a man's head off without knowing the circumstances.

SECRETARY MAYO: I think it is right that they should know. A member from North Carolina sent in some advertisements from local papers of the Carolinas Remedies Company, of which Dr. Buchanan is the president, and said that they didn't like it down in South Carolina. I wrote to Dr. Buchanan and told him that complaint had been made and that I hoped that he would discontinue this. I also wrote to the dean of the college from which he graduated, sending him copies of the advertisement,



and asking him if he couldn't bring some pressure to bear on Dr. Buchanan to discontinue. We weren't able to accomplish anything. "Satisfaction guaranteed," and so on. It is glaring. After we couldn't get him to discontinue it, charges were preferred by the Resident Secretary from that State, and Dr. Buchanan was notified to appear and defend himself against those charges. He replied, tendering his resignation to the Association. I notified him then that in my judgment the Executive Board would not accept the resignation of a member against whom charges were pending, and that he should appear and defend himself against those charges, and he has made no answer to that.

DR. BELL: I was a member of the Executive Board of the Southeastern States Association last winter, and Dr. Buchanan had an application in for membership, and we rejected him on those grounds.

(The motion to accept the recommendation of the Executive Board that Dr. Buchanan be expelled from the Association was put to vote and was carried.)

SECRETARY MAYO: At the last meeting in Columbus the Executive Board was authorized to appoint a Council on Chemistry and Pharmacy similar to that of the American Medical Association. The Executive Board has had this under consideration during the past year, and it recommends that the Council on Chemistry and Pharmacy be made a permanent committee, consisting of five members, one to be appointed for one year, one for two years, one for three years, one for four years and one for five years—that is, at first—and that one shall go off this committee each year thereafter.

DR. STANGE: Wouldn't that require an amendment to the Constitution and By-Laws?

SECRETARY MAYO: I think it would. It hadn't occurred to me before. "There shall be the following standing committees consisting of five members except as otherwise provided." It gives the five committees, but it would seem to me that they can be otherwise provided if the Association so desires.

DR. CARY: In construing that part of the By-Laws, that "otherwise provided" meant for other committees, not standing committees. If you put this through, you have to have an amendment to the By-Laws. Therefore I move that this recommendation be offered as an amendment and referred to the Executive Board for report next year.

(The motion was seconded by Dr. Adams and carried.)

SECRETARY MAYO: I have some telegrams I would like to read. I think the Association will be interested in them.

I sent a message of greeting to Dr. Archibald, a member of the Executive Board from the Sixth District, who is ill. He says: "Thanks for the kind wishes, and I hope you have a pleasant and profitable meeting."

I also received a message from Dr. Blattenberg, Lima, Ohio: "Why is mountain dew? Best wishes for good meeting." (Laughter.)

REPORT OF COMMITTEE ON INTELLIGENCE AND EDUCATION

PRESIDENT WHITE: Is the Committee on Intelligence and Education ready to report?

(Dr. Bergman read the report of the Committee on Intelligence and Education, as follows:)

During the past year twelve of the fourteen veterinary colleges in the United States and Canada approved by this Association have been visited by members of this committee, and in addition one college, the Georgia State College of Agriculture, Division of Veterinary Medicine, which is asking recognition this year as an approved institution. With two exceptions these institutions were visited while school was in session. In all cases the visiting members of the committee were courteously received, every assistance being given in carrying out the inspection and all requested information relative to entrance requirements, curricula, faculties, teaching methods, equipment, etc., freely furnished.

Data secured by the committee indicate that all veterinary colleges at present recognized by the Association are complying with the regulations relative to entrance requirements, length of curriculum and transfer of students. Relative to the latter, the Secretary has from time to time referred correspondence to the committee from various deans relative to questions of transfer of students from certain of the nonaccredited schools. Questions relative to the interpretation and enforcement of entrance requirements, status of Federal Board students and certain individual cases needing special consideration have been referred by various deans to the committee for suggestions, the attitude in all cases being to comply with the suggestions made.

Investigations of the various colleges this year showed, in a number of institutions, a marked improvement in general condition over last year, improvements varying from additional buildings and equipment to improvement of faculty personnel and general instructional methods. Several institutions have secured within the last year modern buildings which were badly needed, the aggregate value of which will total into several hundreds of thousands of dollars. The committee believes that it is not breaking faith in stating that the A. V. M. A. through its Committee on Intelligence and Education has by correspondence, recommendations and personal conference with college authorities been of considerable assistance to the deans in securing many of the above-mentioned improvements. Developments of the past year would seem to indicate that close cooperation between this committee and the deans of the various veterinary colleges can be made of considerable mutual benefit in securing needed improvements at the various schools, working ultimately for the betterment of the veterinary educational situation, which is the aim of the Association.

The future standing of the veterinary profession depends upon the educational standards it maintains. The foundation of the profession is its education. If the veterinary profession can not, or does not, maintain educational standards equivalent to those of other professions, then it can not expect to become permanently established on an equal plane with them.

It is the earnest desire of the committee to cooperate with the various veterinary colleges for the betterment of veterinary education. The attitude of the committee should be and is a cooperative and helpful one rather than strictly critical. It is not the intention to

injure or work a hardship on any educational institution by excessive demands, but rather request a reasonable standard of educational efficiency. As has been demonstrated in the past, the prestige of the A. V. M. A. can be of considerable assistance to the various schools in securing needed improvements.

During the past year the committee has had two meetings in Chicago, the first at the time of the Live Stock Sanitary Association meeting, to discuss the recommendations of the committee as approved at the Columbus meeting, hear subcommittee reports and outline future plans, and the second following the inspections of the various schools to discuss the general educational situation, outline suggestions to the various schools and plan the committee report for this year. Criticisms and suggestions which the committee believes of a constructive nature have been forwarded to the deans of various institutions and for the most part have been acknowledged and favorably received.

Considerable comment has been made in the veterinary press generally, the past two or three years, relative to the decrease in number of students attending veterinary colleges since the year 1916. The following tabulation shows a total of 870 students matriculated for the session 1920-21 in the fifteen veterinary colleges accredited by this Association. Of this number 187 were freshmen. In addition there were approximately 120 students attending colleges not accredited, or a total of 990 attending the veterinary colleges in the United States and Canada. This is approximately one-third the number attending the 23 veterinary colleges existing in 1916.

Numerous factors are responsible for this decline, the principal one undoubtedly being the increase in entrance requirements and length of curriculum. There are those who have become so alarmed over a shortage of veterinarians that they have advised lowering entrance requirements and the veterinary colleges again accepting any one unable to enter the other learned professions. This is certainly not the remedy. The remedy lies rather in increased publicity regarding the profession's attainments, better remuneration for service, better appropriations for veterinary colleges and veterinary research whereby veterinary education may assume a position on a par with the other professional and technical lines of work and be properly regarded and appreciated by the public. Our worthy president, Dr. White, summed up the situation in a few remarks in a recent address when he stated as follows:

"We are already far enough behind the entrance requirements of the other professions. We can not make progress by walking backwards. In the final outcome the matter will adjust itself. If in the next few years the number entering the profession is too small to meet the demand, the public will recognize the fact and we will again find our veterinary institutions filled."

Last year the Association approved a recommendation of this committee that it be empowered to outline what might be regarded as the "essentials of an approved veterinary college" and also a schedule whereby veterinary colleges might be graded and, if desirable, classified, and after submitting these to the Executive Board that the two bodies inaugurate the use of the same for the inspection of veterinary colleges during the year 1920-1921. In working out the suggested outlines the committee studied closely the general plan used by the Council on Medical Education of the American Medical Association and secured valuable cooperation from the secretary, Dr. N. P. Colwell. The matter of a schedule for grading and classifying veterinary colleges has been given considerable study by this committee; however, no plan is suggested or recommendations made at this time. The matter needs

## STUDENT ATTENDANCE AT APPROVED VETERINARY COLLEGES, SESSION 1920-21.

Name of Institution	First Year	Second Year	Third Year	Fourth Year	Special	Total
Alabama Polytechnic Institute.....	20	15	12	6		53
Colorado Agricultural College.....	26	22	20	20		88
Georgia State Agricultural College <sup>1</sup> .....	7	7	3	4		21
Indiana Veterinary College.....	11	28	23	73	1	136
Iowa State College.....	30	24	18	22		94
Kansas State Agricultural College.....	9	20	13	18	1	61
Michigan Agricultural College.....	1	8	4	8		21
Université de Montréal.....	12	4	4	6		26
New York State Veterinary College (Cornell).....	13	32	15	16	2	78
New York State Veterinary College (New York University).....	7	3	5	8		23
Ohio State University.....	19	30	30	25		104
Ontario Veterinary College (Toronto, Canada).....	28	32	22	17		95
University of Pennsylvania.....	4	8	7	11		30
Texas Agricultural and Mechanical College.....	1	5	2	6	4	18
State College of Washington.....	3	1	6	12		22
TOTAL.....	187	239	184	252	8	870

<sup>1</sup> Recommended for approval 1921.

further study, and it is probable that the cooperation of the deans of the various colleges will be requested at a future time to assist in the outlining of such a schedule. The following tentative outline of the essentials of an approved veterinary college has been prepared by this committee to serve as an aid in the inspection of veterinary colleges:

## ESSENTIALS OF AN APPROVED VETERINARY COLLEGE

*Entrance Requirements*

1. The matriculation requirement of an approved veterinary college shall be not less than four years of high-school work or equivalent studies taken in other preparatory schools, provided that candidates for admission to approved veterinary schools who can not present a satisfactory certificate from the proper official of the school or schools attended covering the required amount of preparatory work may be admitted upon passing satisfactory examinations approved by the proper State educational officers.

*Administration of Entrance Requirements*

2. The admission of students to the veterinary school must be in the hands of a responsible committee or examiner, whose records shall always be open for inspection. Documentary evidence of the student's preliminary education should be obtained and kept on file. When the veterinary school is an integral part of a university, this work usually devolves on the university examiner. Unless the university examiner and his records are closely accessible, however, some officer at the veterinary school should obtain and keep on file documentary evidence of each student's preliminary education, including both high-school and collegiate work.

*Advanced Standing*

3. (a) Full advanced standing may be granted to students only for work done in other approved veterinary schools, and in granting advanced standing official verification of the student's previous veterinary work should be obtained by direct correspondence with the college previously attended, and his preliminary qualifications should also be verified and recorded the same as for freshman students.

(b) Advanced standing granted to students for work done in non-approved veterinary colleges should be strictly on the basis of exam-

inations in the particular subjects in which credit is desired. As in the case of students seeking full advanced standing, official verification of the student's previous veterinary work should be obtained and his preliminary qualifications should be verified and recorded.

#### *Attendance*

4. (a) The college should require that students be in actual attendance in the college within the first ten days of each session and thereafter.

(b) Actual attendance at classes should be insisted on except for good cause, such as for sickness, and no credit should be given for any course where the attendance has been less than 80 per cent of the full time.

#### *Supervision*

5. (a) There should be careful and intelligent supervision of the entire school by the dean or other executive officer who holds and has sufficient authority to carry out fair ideals of veterinary education as determined by the present-day knowledge of veterinary medicine.

(b) There should be a good system of records showing conveniently and in detail the credentials, attendance and grades of the students, by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of students at hospital and ambulatory clinics.

#### *Faculty*

6. (a) The college should provide at least five thoroughly trained veterinarians in charge of major departments, salaried so that they may devote their entire time to instruction and to that research without which they can not well keep up with the rapid progress being made in their subjects. A sufficient number of assistant veterinarians should be provided to conduct the work properly, the number of the latter being governed by the number of students and amount of research work being conducted. In no case should a head of department be a veterinarian of less than five years' experience in his particular major subjects.

(b) The faculty should be made up of graduates of recognized veterinary colleges. Other than veterinarians should be selected as teachers of veterinary subjects only under exceptional circumstances and only when veterinarians of equal special capacity are not available. The faculty should be thoroughly organized with an executive head or dean and each department having its head professor directly responsible for all instruction given in his particular department.

#### *Curriculum*

7. (a) The college curriculum should be fully graded and extend over four collegiate years of not less than thirty-two weeks each and of not less than seventeen credit hours per week, exclusive of time required for matriculation and holidays. The courses offered in the various subjects should be set forth in the annual announcement, so as to show for each course its number, subject, content, character (lecture, recitation, laboratory or clinic), length of time devoted to each and the amount of credit allowed. The courses for each class should also be clearly set forth in a class schedule, for the guidance of the students.

(b) The college should give two years of work consisting largely of laboratory work in well-equipped laboratories of anatomy, histology, pathology, embryology, physiology, chemistry, bacteriology, pharmacology, therapeutics and clinical diagnosis. In addition selected animal husbandry subjects, such as breed types and judging of livestock, animal breeding and feeds and feeding, should be required.



Present-day knowledge makes it essential that these subjects be in charge of full-time, well-trained teachers.

(c) Two years of clinical work with courses in medicine, surgery (including surgical anatomy and operative surgery on experimental subjects), obstetrics, serum therapy, parasitology, sanitation, food hygiene and necroscopy.

#### *General Teaching Facilities and Instruction*

8. (a) The college should show evidences of thorough and reasonably modern instructional methods in all departments. Adequate classroom and laboratory facilities and such equipment as is generally regarded as being essential to the teaching of the various laboratory branches should be provided. Evidences should be shown that student work is being carefully supervised and that equipment and facilities are being intelligently used in the training of veterinary students.

(b) Each college should be supplied with such auxiliary equipment as projection and photographic apparatus, charts and other apparatus now so generally used in medical teaching.

(c) Modern experimental laboratory work in physiology, pharmacology, bacteriology, as well as for medical research, necessitates a supply of animals such as frogs, rabbits, guinea-pigs, etc., and proper provision is necessary for the housing and care of such animals.

(d) There should be sufficient embalmed material to enable each student to dissect the lateral half of the horse, ox, pig, sheep, dog, cat and fowl and to provide cross sections, special dissections and other demonstration material. Care should be used to provide material from both sexes of each species for simultaneous dissections and demonstrations. Pregnant and immature subjects for dissection are also helpful. In the case of the horse, at least, a living animal should be in the dissecting room for a "palpator."

(e) The college should have a working library, to include the more modern veterinary text and reference books together with related scientific text-books and journal files. The library should receive regularly the leading veterinary and related scientific periodicals, the current numbers of which should be in racks or on tables easily accessible to the students. At the end of each year these periodicals should be bound and added to the files of bound periodicals. The library room should be properly lighted and heated, and open during all or the greater part of the day.

(f) There should be a working museum having its various anatomical, surgical, obstetrical, pathological and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from post-mortems there also be kept the record of the postmortem, the clinical history of the patient on which the postmortem was held and microscopic slides showing the minute structures of the diseases shown in the gross specimen. The museum furnishes an excellent means of correlating the work of the department of pathology with that of the clinical departments.

#### *Clinical Facilities and Instruction*

9. (a) The college should be provided with a clinic building or clinic rooms with facilities for receiving, recording, examining and treating medical and surgical cases of all species of animals. The building should contain a dispensary with drugs, instruments and instrument sterilizers; one or more operating rooms with operating tables for large and small animals; a clinic room for the examination and daily treatment of patients, and stalls and kennels for hospital patients.

(b) An average of not less than 100 cases per month, well dis-

tributed as to species, is desirable for senior classes of twenty-five students or less, these cases to be of such character as to permit the students to see and study the common variety of surgical and medical cases in each species.

(c) Clinical instruction should be offered to junior and senior students. The same cases may be used for both classes, each case being assigned to a senior student having one or more junior assistants. Each student group should be responsible for making a detailed examination of the patient assigned, assisting in the treatment, and making careful records of the case until it is discharged from the hospital. Where clinical material is limited the instructors should see that each student in the class has knowledge of each and every case, and students should be required to pass examinations in their clinical work as well as any other subject.

(d) Facilities should be provided for proper postmortems on animals dying in the clinics during each college session, which should be attended by both classes and participated in by senior students. These should be performed in cooperation with the professor of pathology.

(e) The clinical staff should include the professors of medicine and surgery and their assistants, and they should have the close cooperation of the professors of pathology and bacteriology. The examination of patients, the preparation of drugs and instruments should be under the close supervision of the instructors, and all treatment and operations should be done by the instructors assisted by the students assigned to the case. Attendance at the clinic should be prompt and regular on the part of students and instructors.

(f) An ambulatory clinic should be maintained for senior students under the direction of a good practitioner and instructor who is a regular member of the faculty. Students should be assigned to this work in small groups for definite periods, and the members of each group should go on all calls during their periods of assignment.

19. A clear statement of the college's requirements for admission, tuition, sessions, courses offered and graduation should be clearly set forth in regular annual catalogs or announcements.

In visiting the various colleges this year your committee has endeavored to apply the above outline as a basis for judging the work of the various institutions, and it has proven of material assistance in securing a greater degree of uniformity in the school inspections. No institution visited presented, of course, a condition of 100 per cent efficiency. As previously stated, certain institutions showed a marked improvement over their 1919-20 condition and have endeavored to carry out as far as possible previous suggestions and recommendations of this committee.

Last year at the Columbus meeting this Association approved of the principle of a publicity campaign the aim of which was to bring before the public some of the important phases of veterinary medicine in reference to the relation of the profession to public health, advancement in education, field and scope of work and its general relation to society. However, after careful consideration by this committee, in addition to conferences with the Executive Board, it was not deemed advisable, on account of lack of funds, to begin publicity work of this nature the past year. Recently the subject has again been brought to the attention of the profession through the editorial columns of one of our veterinary journals, wherein comment and suggestions are presented in connection with a discussion of a "News Service for Science" recently established in Washington, D. C., under the name of "Science Service." Science Service is the name of an agency newly established in Washington through the generosity of

Mr. Edward Scripps of Miramar, Calif., for the diffusion of knowledge regarding science. The governing board of fifteen trustees is composed of representatives of the National Academy of Sciences, the American Association for the Advancement of Science, the National Research Council, the Scripps Estate, and the journalistic profession. Its function is to serve all sciences, acting, as it were, as an ethical agent between scientific circles and the outside world, and through popular science writings instruct the people as a whole regarding the aims and achievements of the various branches of modern science. It would seem that this service might afford the means of giving to veterinary science and the veterinary profession a wider and more desirable publicity, and is worthy of investigation by this Association.

#### *Summary*

1. This committee recommends the following list of veterinary colleges as approved colleges for the ensuing year:

- Alabama Polytechnic Institute, College of Veterinary Medicine.
- Colorado State College, Division of Veterinary Medicine.
- Georgia State College of Agriculture, Division of Veterinary Medicine.
- Indiana Veterinary College.
- Iowa State College, Division of Veterinary Medicine.
- Kansas State Agricultural College, Division of Veterinary Medicine.
- L'Ecole de Médecine Vétérinaire, Université de Montreal.
- Michigan Agricultural College, Division of Veterinary Science.
- New York State Veterinary College at Cornell University.
- New York State Veterinary College at New York University.
- Ohio State University, College of Veterinary Medicine.
- Ontario Veterinary College, Toronto University.
- State College of Washington, College of Veterinary Science.
- Texas Agricultural and Mechanical College, School of Veterinary Medicine.
- University of Pennsylvania, School of Veterinary Medicine.

2. This committee recommends that the "Essentials of an Approved Veterinary College" as herewith submitted be approved.

3. This committee recommends that this Association, through an authorized committee, investigate the newly organized "Science Service" as herein mentioned, and if advisable endeavor to have such educational publicity articles prepared as may properly give the profession wider publicity, and, following approval of the committee, be placed at the disposal of this science news agency for publication.

4. This committee recommends that, in order that sufficient funds may be available for the work of the Committee on Intelligence and Education to carry out properly its projected work, the Budget Committee, if it deems advisable, increase the appropriation for the work of this committee from \$1,000 to \$1,500 for the ensuing year.

- CASSIUS WAY, *Chairman*  
(Term expires 1922),
- L. ENOS DAY  
(Term expires 1921),
- L. W. GOSS  
(Term expires 1925),
- B. T. SIMMS  
(Term expires 1924),
- H. D. BERGMAN, *Secretary*  
(Term expires 1923),

*Committee on Intelligence and Education.*

PRESIDENT WHITE: You have heard the very excellent report of the Committee on Intelligence and Education. What shall be done with it?

DR. SISSON: I move that the report be adopted.

(The motion was seconded by Dr. Hoskins.)

DR. EICHHORN: There is one recommendation with regard to the heads of departments which I think ought to be amended. If I understand correctly, the statement was that the head of any department should require five years' experience in that particular branch. It seems to me that sometimes it might work to the disadvantage of a particular college if you adopt that. Have the time limit stated definitely. It might be that the professor in some veterinary college might be suited if there is a vacancy in some other department. If we adopt this, I don't think this could be accomplished, so I move that the committee change this particular clause.

PRESIDENT WHITE: Is this clause mandatory, Dr. Bergman?

DR. BERGMAN: It says "in no case *should* a department," etc. It is not mandatory.

PRESIDENT WHITE: The motion to accept the report is before you.

DR. R. C. MOORE: I would like to offer an amendment to the report: That the St. Joseph Veterinary College be considered in the accredited list of this Association.

(The motion was seconded by Dr. Conrad.)

DR. BERGMAN: If I understand Dr. Moore's motion correctly, it is that the St. Joseph Veterinary College be added to the list of approved veterinary colleges. This would seem to be a very extraordinary request on the part of Dr. Moore, as this committee has no information as to the condition of this veterinary college during the past year. St. Joseph Veterinary College was discredited at the New Orleans meeting and asked for re-examination the next year, and the committee, following the re-examination, recommended at Columbus that it remain on the discredited list. It does not seem that we should place on the approved list a college regarding the present condition of which we have no information.

DR. R. C. MOORE: I would like to explain the situation. Last year, when we were rejected at Columbus, a motion was made immediately asking that our institution be inspected again for future consideration. During the discussion on that question the Chair made the statement that it was unnecessary to adopt such a motion because our college would be regularly inspected in the rounds of inspections. We have depended upon that statement. We have waited day after day, throughout the year, expecting from time to time that this committee would visit us and inspect the institution. I even waited at home until the last train before I could reach this convention, thinking they might stop there on their way to the meeting, as most of them

lived beyond that point. They did not come. The fact that it has not been inspected is no fault of ours. We are meeting every requirement as read here today by the chairman of this committee. We have put in last year our full time as we did the year before, of thirty-two weeks of actual teaching time. We have taught every subject that is required. We have taught it as thoroughly, I believe, as any other school is doing. Our clinics have been good. In fact, the men who have graduated from that institution in the last year, I believe, particularly have demonstrated this fact, and they have passed your State boards wherever they have gone. Not a single failure has been reported this year.

We graduated thirty-seven men. We had a hundred students, and we did not admit a single man except on the high-school requirements as required by this Association, and we do not see why we should be discriminated against, and not be allowed the privilege of other members of this Association. The faculty and members of that institution are members of this Association. We have been members of this Association for a good many years. We have done our part as best we could for the upbuilding of this Association. We believe we have no right to be discriminated against because of no failure on our part.

We ask to be reinstated to the list of accredited colleges, and if we are found to be not living up to these conditions, we are willing to take the consequences. I ask you, gentlemen, to consider this carefully and not do an act that will ruin an institution that has labored year after year, and that will ruin the men at the head of the institution who had labored year after year for the upbuilding of the institutions of the country. I ask you to consider this carefully and vote as you think is right.

If we are discredited this year it means another hardship to maintain a sufficient number of students to meet our expenses. We did so last year, notwithstanding the fact that we received a stunning blow, and accusations were made against us, that somehow or other came to the committee, that were not correct.

I want to say one thing while I am on the floor. I am not saying this to discredit the committee, but to prove what I said. The statement was made at Columbus (that was one of the contentions of the committee) that we had admitted men to advanced standing who should not have been admitted. The chairman of the committee made the statement that we had admitted Edward Trenton Prends, who had come to us with credit for two years' work in the Iowa College, with a certificate on which was written "disqualified." I didn't believe it at the time. The man had been an elegant student, and the committee went on to say that this man was not bright. Where they got their information I do not know. I have in my pocket a photograph of that certificate. It is here for your inspection. Not a single line of any description is written across its face. Down



in the corner, however, is written: "Letter of honorable dismissal hereunto attached."

I have the letter here, which reads as follows:

"To Whom It May Concern: This is to certify that Edward Trenton Prends is this day at his own request granted this testimony of honorable dismissal, September 14, 1918." It is signed by the registrar.

They didn't stop with that. It seemed that they liked him.

"Mr. Trenton Prends, Moulton, Iowa. My dear Mr. Prends: Replying to yours of the 1st instant, we are inclosing herewith certificate of your credit with letter of honorable dismissal. We are sorry to lose you from our student enrollment and hope you will enjoy your work wherever you decide to register, and that you will return to Iowa State College later to finish your course."

I admitted this man on these credentials, and I believe I did right. I believe they are as clear as can be, and I am reading you this to show you that this committee has been misinformed from some source or other. I believe it was an injustice to this man to make a statement of this kind. That is the reason I am reading this and showing these documents here for your consideration.

I again ask you to give this your careful consideration.

DR. BERGMAN: Mr. Chairman, one might think from the latter part of Dr. Moore's discussion that his institution was refused recognition because of this particular case (Trenton Prends). If this committee made a mistake in the examination of the credentials of one student, that would not be remarkable, because when you go into an institution and commence to examine the credentials of the students, it is quite a complicated task. At the New Orleans meeting the criticism particularly emphasized was the matter of matriculation requirements, because at the meeting in New Orleans, when the St. Joseph School was first discredited, it had failed to meet the matriculation requirements laid down by the Association relative to four years' high school, and there was no use of further discussion. Neither had the requirements been met at the time of the Columbus meeting, for the school had not yet opened for the season of 1920-21.

In addition, however, the objections of the committee to the St. Joseph School went further—namely, that there was a lack of proper facilities to carry out efficient veterinary educational work. So far as this individual instance that Dr. Moore brings up is concerned, if the committee owes an apology for that, all well and good. Don't think, however, that this individual instance was responsible for the discrediting of the St. Joseph Veterinary College. The committee recommended that the St. Joseph Veterinary College be discredited largely in view of the fact that in the opinion of the committee it was not carry-

ing out efficient educational methods and did not have the facilities to do so.

Relative to the inspection of the St. Joseph College this year, if the committee had had any idea that it desired inspection, it would have been given. The committee was not requested to inspect the college by the college authorities, neither was it instructed by the Association to inspect the college.

The committee discussed the case of the St. Joseph Veterinary College at the meeting in Chicago in December, and it was agreed that inasmuch as we had not been requested to do so, we would not inspect the college. Do you suppose for a minute that this committee would walk into an institution over which the Association has no jurisdiction and inspect it without being requested to do so? If we had been requested to inspect the St. Joseph Veterinary College we would have done so. As a matter of fact we heard reports to the effect that it was immaterial to the college whether it was recognized by this Association or not.

We sincerely hope, as the committee is directly responsible, that this Association will not see fit to approve this college without definite information as to its present condition and educational methods being employed.

DR. CAHILL: Last year we asked for a committee to investigate this college at once that we might be put upon the accredited list. The Secretary at that time made the remark that he would fight with every power available the appointment of a special committee or a visitation of the regular committee to this school at that time, saying at the time that this would be investigated and looked after during the regular visitations. Dr. Cary in his remarks said that this school would be visited by the regular committee during the course of the year. We not only asked for this committee to investigate us, but we tried to get a special committee or this committee to make a special trip to investigate us, and did not succeed. It seems strange to me that in the face of that evidence this committee will come before you here and say that they had not received an application from this college to visit it.

During the year we have endeavored to keep up the high standard of the school as it has been in the past. The statement was made that the college was lacking in certain essentials. I would refer the Doctor to the previous report of the previous committee, which complimented us upon our laboratory facilities and the manner in which the work was conducted. No change had been made during the time. It is strange that two committees would differ to that extent.

We waited until last Sunday for this committee. It is no fault of ours. If this convention thinks it is fair to this school that we should stay on the discredited list for another year on account of a mistake of this committee, it is up to you. We ask for nothing but justice. (Applause.)

DR. CONRAD: It has been my pleasure and privilege to be in close proximity to this college. I live a short distance out of this city. I will state plainly I never had any request to visit this college. I go to St. Joseph frequently, and invariably loiter around and visit the college and visit the classes. I am a member of the State Veterinary Board in Kansas, having been appointed this last year. I looked over the papers of the graduate members of the class, and I must say, in highest regard, they passed better examinations than I ever had the privilege of reading from any college or any institution.

I am not saying this on account of any friendship I have for the college, the professors, or anything of that sort. This talk I give you comes unsolicited. I talked with Dr. Luckey, of the Examining Board of Missouri, and every man passed the examination. I had the opportunity of perusing some of the questions asked this class, and I will state that it was a very severe examination. They gave a real examination. We gave one entirely different, but covered the subjects in completeness, and the men from St. Joseph passed a very creditable examination. Dr. Wolfe was president of the board, and he said, "We have to give St. Joseph a handclap for the manner of their educating their students in this college." (Applause.)

DR. R. C. MOORE: I would like to call attention of the Association to the fact that Dr. Bergman seems to think it would be improper to accredit this college without the recommendation of the Committee on Intelligence and Education. I just want to remark that we were discredited in New Orleans in face of the fact that the committee not only recommended us favorably, but the chairman of the committee stood before the Association and pleaded for our continuance on that list. Yet you took it out of the committee's hands and voted us out. Is it any more harm to vote us in without the recommendation of the committee than it was to vote us out? (Applause.)

DR. GRAEFE: I happened to be present at the Columbus meeting last year, and think I understand the proceedings in reference to this question. I would take it to mean that that institution at that time was promised consideration and inspection during the ensuing year. I have been in the office of the St. Joseph Veterinary College once. I have never been through the institution, and know nothing about their equipment or any of the other circumstances in question, but it does seem to me like an injustice that when these matters are brought so forcibly before this Association, the Committee on Intelligence and Education did not take the means to be able to know something about this institution when this question was brought up at this time.

I don't know what the Constitution and By-Laws say in reference to that matter, but it seems to me if we want to conduct efficiently the aggressiveness of veterinary education in this country, when there is one institution in question, as this one

has been, that the mere matter of the formal request, whether given or not, should not be justification for keeping this institution on or off the accredited list, if it is entitled to be on it. It seems to me as though it is a matter of justice and justice only, and one which, if not given at this time, is going to delay that institution another year, which is a very vital factor in its management. I don't want to be responsible for any sentiments to lower the educational standards, but I do feel that the interest of the veterinary profession in this country demands that every institution in this country be given justice. (Applause.)

DR. SIMMS: As a member of the Committee on Intelligence and Education I beg to call attention to the happenings at Columbus last year. The St. Joseph Veterinary College did not request on the floor at Columbus that we inspect the institution this year, but where the request came in was in a motion from Dr. Koen, asking that the Committee be instructed to inspect, with power to put the institution back on the list of accredited colleges without referring back to this Association. The request was a motion asking that our committee be given power to act. The motion was lost, Dr. Mayo stating, as has been said, that he would fight very much any motion or movement to give the committee power to act without referring back to the Association as a whole. That was the only request that we received, that request coming, as I say, from Dr. Koen in form of a motion, which the house as a whole voted down. There has been some little discussion of what took place there, and I wanted to call attention of all the members present to what happened there. I have looked up the minutes of the previous meeting. (Applause.)

DR. P. A. FISH: There seems to be a question of veracity involved, and that, perhaps, can not be settled at this meeting. I was at the New Orleans meeting and remember when this question came up for discussion. The requirements for the accredited list were published in advance, and the private schools had a meeting to talk over the future and discuss whether or not they should comply with these requirements. As a result of that meeting certain of the schools did comply with the requirements and were recognized and accepted by the Association. The St. Joseph School did not comply with the requirements at that time, and yet a very earnest plea was put up at the New Orleans meeting for it to be taken in on the accredited list just the same. That brought up the question of fair play. Is it right to penalize an institution that did comply with the requirements, although much hardship was involved, and overlook the negligence or possibly the defiance of another school that failed to take the proper action? I think that was the question at issue. Nobody who intends to do justice in connection with this matter would be willing to take this school into the Association without any examination. The committee has been appointed for the

very purpose of looking over the equipment of the schools. It is their function to know about these things, and their opinion is more valuable to the Association than that of parties directly interested in the school, because their opinions are naturally more or less biased.

I think the Association should stand by its committee. I think we should be guided very largely by what they have to say. It is unfortunate that the committee has not been asked to visit the school before this time. It is difficult for the layman in the Association to judge, but the issue now seems to be whether the school shall come into the Association on the statement of its dean or whether it shall come in in the proper way, by recommendation of the committee.

DR. CONRAD: In the face of the remarks the gentleman just made, I would offer an amendment to the amendment, which is contrary to the motion, that three additional members be added to the committee, to make immediate investigation of the St. Joseph Veterinary College, and if their findings are such that it is an accredited college, that it be immediately published and recommended.

(The motion was seconded by Dr. Connaway.)

DR. STANGE: I rise to a point of order. I think that amendment is unconstitutional. The Constitution provides for the Committee on Intelligence and Education and its personnel. Any committee that would be appointed to investigate this institution would have to be a special committee or a committee to cooperate with this committee.

PRESIDENT WHITE: The Chair sustains the point of order.

DR. CONRAD: I make a motion to amend the amendment, that the Committee on Intelligence and Education be asked to inspect immediately the institution and immediately report to the Association. (Seconded.)

DR. BERGMAN: This committee is to report to the Association annually. We can not report until the next annual meeting of this Association. We shall be very glad to make the inspection upon request.

PRESIDENT WHITE: Is there any further discussion?

DR. SISSON: It seems to me this last motion is unnecessary. It can't be amended.

DR. CONRAD: In view of the fact that you give complete power and usually do according to the recommendation of the committee, it seems to me that we have held this in suspension long enough; that this college should be either recognized or disqualified forever, and it is a discrimination to keep this college out if it is complying with the requirements which establish a good college. We should act in some manner according to technicality of some kind. This college deserves looking into.

PRESIDENT WHITE: An amendment to an amendment must be germane. The Chair will rule the amendment to the amend-



ment out of order because it is not germane. The question resolves upon the amendment to the motion. The amendment is to add the St. Joseph Veterinary College to the list of accredited colleges of the Committee on Intelligence and Education.

DR. KOEN: It is with much reluctance that I rise to speak on this question. For days an effort has been made to prevent just this situation, and just before entering this room with this committee some effort was made whereby a solution might be had without a rehashing of everything that has transpired. The reason for this effort was the benefit of the Association, the prevention of further ill will, the accomplishment of justice toward all. The suggestion at that time was that an application be made at this time for an immediate investigation by the Committee on Intelligence and Education, of the St. Joseph Veterinary College, to determine whether or not it was meeting the requirements. It was also suggested that the Intelligence Committee, in order to show that it bore no ill will and no grudge and did not intend to discriminate against the St. Joseph School, request of this Association that the chairman appoint three other members of the Association to accompany that committee to make this investigation. It is not the desire, I am sure, that the Committee on Intelligence and Education be discredited, and I do not believe that it is the desire of this Association that the St. Joseph Veterinary School be discriminated against if it has been meeting the requirements.

I regret that the motion by Dr. Conrad was not made in a little different form. I don't know that it could be made so as to be considered germane by the chairman, but if it were possible for a motion to be made that the rules and By-Laws be suspended, and that three additional members of this Association supplement the Intelligence Committee for immediate investigation, and that their findings be published in the JOURNAL, surely then the credit should be due the St. Joseph Veterinary College and no injustice would be done; neither would the Association be on record as supporting something that would be unfair.

I make this statement since I have been mentioned by Dr. Simms (he quoted me correctly), and I think it is just that you know what has been attempted.

DR. CONNAWAY: We had a President once who said in a great crisis that it is not a theory but a condition which we confront, and the condition that confronts us now in this country is a shortage of veterinarians. You all know that I have always stood up for high standards. I would put the Cornell graduate or the State college graduate in every county in this whole country, if I could, or some of these other good schools; but we have in Missouri, where this school is located, twenty-five counties that have no veterinarians. Those people need veterinary service. I, from my college, have to teach county agents and extension men some veterinary knowledge so that they can give

these people veterinary service. Not very long ago I wrote to Dr. Moore, "Have you a good man you could send to Versailles, in Morgan County?" He wrote back that he didn't have him. If I had written to Iowa, Cornell, Pennsylvania, or any other place, I am sure I couldn't have gotten him there.

I am not in favor of this body here going over a regularly established committee and voting this school in, but I believe it is justice to this school that we should provide some means by which they can establish their qualifications to the satisfaction of this Association that they are meeting these requirements. I don't believe that we ought to let them in one minute sooner than they meet the full requirements of this Association, and I believe they ought to come in through the regular channels, not through any sympathy that we may arouse here on account of injustice or misunderstanding.

Therefore I renew the motion that the committee be instructed to inspect this school at the very earliest moment possible, and that they be empowered by this body to admit it back into regular standing, or reject, as may be the case.

If this body here can vote that school in, it certainly has the power to give that same power to that committee. If we don't stand by our committees we had better not have the committees. That is my stand on this matter.

I hope to see this school reinstated; I hope to see it come up to the full requirement of this Association. If we had the means at our universities to do this work, we would do it; but you know that it takes a lot of money to run a great institution like a university. It has a large number of departments. We need a large amount of money for running what we have, and if we can have a little help for running institutions and those located here and there over the country, we would be glad to have some. Send us good veterinarians. We need them. We have a good field for them. (Applause.)

DR. COTTON: I wish to second Dr. Connaway's amendment. Provided you don't consider that germane, I want to request Dr. Moore to withdraw his motion.

PRESIDENT WHITE: Dr. Moore, do you wish to withdraw your motion, your amendment, with the consent of the second?

DR. R. C. MOORE: We are now within a very few days of the opening of the school, and the only advantage that this school could gain this year by recognition would have to come within that space of time. I can see no advantage to us in any way for inspection to be made, because the time will be past to visit us with any benefit this year. If we wait another year we might as well wait regular order. Therefore I would not like to withdraw the motion.

PRESIDENT WHITE: The Chair will rule the motion of Dr. Connaway out of order.

SECRETARY MAYO: It doesn't seem to me that this Association

can do otherwise than follow the Constitution and By-Laws. I would like to ask Dr. Moore a question. I confess I don't see how the committee can inspect the school when it isn't running. Suppose, Dr. Moore, as soon as you get fairly started you asked the Committee on Intelligence and Education to visit your school, and if they find on inspection that you are meeting the requirements of the A. V. M. A., if the committee would report that finding to the JOURNAL of the Association, and it should be published, would that meet your needs? It wouldn't be official action by this body, because that could not take place until the annual meeting; but I believe the Association would approve the report of the Committee on Intelligence and Education. That is only my personal opinion. You have already advertised your school, preparing to open the next session, and I confess I don't see how recognizing that school now will be of any benefit to you at all; but I believe it would be a source of satisfaction to your students to know that the school had been inspected after it is running, and that the report of the committee was favorable. Of course, that would still be subject to the action of the Association, and then the students would know that this school will be recognized. It seems to me that that is the only solution of this problem as it is presented to us today.

DR. R. C. MOORE: Dr. Mayo, just as I stated a few minutes ago, it would be too late to be of value to us. A few men are waiting anxiously to know whether they will matriculate with us or not. They want to, but want to know whether they are to be recognized. This would be too late to be of value to them, and the period of matriculation will have gone by. It would be of no benefit to us whatever. If it has to come to that, we might just as well wait until the next year, and take the regular inspection: I can't see where it would benefit us at all.

(The amendment offered by Dr. Moore, that the St. Joseph Veterinary College be added to the accredited list of the Association, was put to a vote and was lost.)

PRESIDENT WHITE: The question now comes on the original motion to adopt the report of the Committee on Intelligence and Education.

(The motion was carried.)

DR. BERGMAN: This committee has another resolution that it would like to present.

(Dr. Bergman read the following resolution:)

*Supplementary Report*

The Committee on Intelligence and Education desires to submit, with its approval, the following:

We, the undersigned, hereby recommend the Honorable J. M. Whittlesey, Commissioner of Domestic Animals of the State of Connecticut, for election to honorary membership in the A. V. M. A.

Mr. Whittlesey from the time of his appointment has recognized the necessity and the advantages of cooperating with the veterinarians in his field of endeavor. In his official capacity he has at all times given

hearty and full support to the veterinary profession of his State and nation. Soon after his inauguration into office he appointed a veterinarian as Deputy Commissioner. The splendid progress in the control and eradication of infectious diseases in Connecticut is largely due to his sympathetic efforts and to the hearty support he always tenders to the veterinarians.

J. R. MOHLER,  
T. E. MUNCE,  
ADOLPH EICHHORN.

DR. KIERNAN: I take pleasure in moving that the report of the committee be accepted.

(The motion was seconded and carried.)

COMMISSIONER J. M. WHITTLESEY: Mr. President, I rise very humbly and unworthily to thank this great Association for the honor conferred upon me, and I shall guard that honor very loyally. I wish to reiterate that there may be no misunderstanding, that I am unworthy of this honor that has come to me unsought and as a great surprise. You have, in adding my name to your list of honorary members, honored Dr. Charles L. Colton, a member of your Association, for his four faithful years in the service of the State as Deputy Commissioner on Domestic Animals. You have honored the present deputy, Dr. George E. Corwin, also a member of the American Veterinary Medical Association. You are honoring that good, efficient association, the Connecticut Veterinary Medical Association, who have rallied around the Commissioner's office as their own department, and who have, with the cooperation and assistance of the Bureau of Animal Industry, with the assistance of Dr. R. L. Smith, inspector in charge, accomplished a wonderfully good work in Connecticut in the past four years. These accomplishments have been recognized by the Public Health Service of the State and the boards of health of the various cities, and have assisted in obtaining the confidence of the Legislature of the State of Connecticut. I do thank you from the bottom of my heart. (Applause.)

#### REPORT OF EXECUTIVE BOARD

SECRETARY MAYO: If it is permissible, I would like to go back to the report of the Executive Board. I have one short thing to report. The Executive Committee recommends that a Committee on Membership be appointed, this committee to consist of the incoming President, the Editor of the JOURNAL, the Secretary, and the Chairman of the Executive Board.

(It was voted, on motion, duly seconded, that the recommendation of the Executive Board be adopted.)

SECRETARY MAYO: There is one item of unfinished business that I want to get finished. At the last meeting of the Association a change of Article 12, Section 1, was proposed, changing the name of the Section on Veterinary Colleges and Examin-

ing Boards to Section on Education and Research. I move that that change in the Constitution and By-Laws be made.

(The motion was seconded by Dr. Hoskins and carried.)

#### PRESENTATION OF PAPERS

PRESIDENT WHITE: We have for this afternoon two papers to be presented. I will call for the paper on "The Need of Cooperation Between the United States and Mexico for the Control of Epizootics," by Dr. Luis Santa Maria of Mexico. Dr. Santa Maria has requested, inasmuch as he does not speak English fluently, that Dr. C. E. Troy of New Mexico read the paper for him.

(Dr. Bemis took the chair at this point.)

(Dr. Troy read the paper of Dr. Santa Maria. It was published in the JOURNAL for December, 1921, page 306.)

CHAIRMAN BEMIS: Gentlemen, you have heard this interesting paper. I am sure you all realize the importance of cooperation between these two countries in the matter of disease control. Do you wish to discuss this paper?

DR. EICHHORN: The paper presented a great deal of interesting material. Inasmuch as a colleague from Mexico has presented for the first time a paper before this Association, I would suggest that Dr. Santa Maria be taken to the platform and introduced to the audience. (Applause.)

(Dr. Santa Maria was escorted to the platform.)

DR. SANTA MARIA: I want to thank you for your welcome. On account of not being able to speak English fluently to express my sentiments to you, I asked Dr. Troy to deliver the address I prepared. (Applause.)

DR. ELIASON: I think it would be too bad to let this opportunity go by without an appreciation of the paper just rendered by our friend from Mexico. As a representative of one of the States that has sent our sister republic a considerable number of cattle, I wish to give him the assurance that we are doing everything we can, and will render him every assistance in our power to do those things which he wishes to have done. (Applause.)

CHAIRMAN BEMIS: We have one other paper on the program in the general session this afternoon, "The Surgical Treatment of Laryngoplegia in the Horse," by Dr. J. W. Adams. (Applause.)

(Dr. Adams read his paper. It was published in the JOURNAL for November, 1921, page 144.)

(President White resumed the Chair.)

#### PLACE OF NEXT MEETING

SECRETARY MAYO: I have invitations to hold the next meeting in New York City, Atlantic City, San Francisco, Cincinnati, and also an invitation that will be presented from St. Louis, and



there is an invitation from Madison, Wisconsin, which you have heard.

DR. MCKENNA: May I ask from whom the invitation from San Francisco comes?

SECRETARY MAYO: From the Convention Board of San Francisco.

DR. MCKENNA: I might say that the veterinarians of California do not believe the meeting should come west at this time.

SECRETARY MAYO: All of these invitations have come from chambers of commerce.

DR. JENSEN: In view of the statement made by Dr. Mayo that all these invitations have originated from chambers of commerce, I desire to say that several weeks ago it was my pleasure to visit the meeting of Wisconsin veterinarians. While this meeting was in session the question of inviting this Association to Wisconsin for the next year was taken up. In view of the fact that this is one of the largest dairy States of the Union, that they have never had the A. V. M. A., and there is a movement to have this meeting come there, I think they are entitled to have the meeting. Madison is a pretty good town; next to St. Joseph it is all right.

In view of the further fact that this meeting constitutes for most of us our annual vacation, we should also select a place where we can vacate pleasantly for a little while. I don't know where you could find more beautiful forests, or more beautiful lakes, than you can find in the State of Wisconsin—and there is water in them, too. (Laughter.) There is a bath with every room. All you have to do is put on your bathing suit and step out.

Furthermore, the University of Wisconsin is located there. It is one of the greatest institutions of learning in this country. It has offered this Association its buildings to use while we are there, and the Animal Husbandry Department has offered its buildings for clinics, something that has been lost track of in the last two years. We have confined ourselves to papers and discussions, and a great many men are still interested in surgery, while perhaps it doesn't seem to be called for as much as it was in years gone by.

There is a question of good fellowship involved. Almost every State in the Union has had this meeting. Although this Association has been in existence fifty-eight years, it has never gone to Wisconsin. They ask you to come there next year.

SECRETARY MAYO: In connection with this invitation, I should present the following resolution that was adopted by the Illinois Veterinary Association:

WHEREAS, St. Louis is centrally located in the Mississippi Valley, reached by twenty-six different railroads and fully equipped to accommodate and entertain a large body of visitors,

*Be It Resolved*, By the Illinois State Veterinary Medical Association, in regular session assembled, that we endorse St. Louis as the meeting place of the American Veterinary Medical Association in 1922, and

*Be It Further Resolved*, That we, as an association and individually, use our influence to accomplish this end, and

*Be It Still Further Resolved*, That a copy of this resolution be spread upon the minutes of the association and a copy forwarded to the National Secretary of the A. V. M. A., and by him brought before the proper authorities at the Denver meeting.

MR. HATFIELD (St. Louis): May I have the courtesy of the floor for a few minutes to speak for St. Louis? In addition to the resolution passed by Illinois (I apologize for not being here Tuesday) I want to call your attention to a few things.

Everything that Madison has said is right. There are some things which no city can give—which I expect to prove to you—as well as St. Louis. I want to call your attention to that so I may have the foundation laid properly.

I am going to present to the Secretary the formal invitation. Here is one from the St. Louis Publicity Convention Bureau. With the exception of Detroit, which has a fine bureau with a manager, the Convention Bureau of St. Louis is the only one of its kind in the world. We were kicked out of the Chamber of Commerce because it was taking 25 per cent of the income to run us. A group of men connected with the Chamber of Commerce organized this bureau, and I took hold of it and have built it up until we have an income of \$750,000 and sixteen people on the staff. My publicity man is Capt. Tourron, who made himself famous because of his success in breaking the record of recruiting U. S. Marines. I am paying that boy \$4,000 a year to get publicity. I have an expert man who does nothing but arrange details; he is a high-priced man.

Here I have the invitation of Governor Hyde of Missouri, in which he invites you to come to the State of Missouri. I have an invitation from the Mayor of the city, Mayor Kiel, setting forth its central location and accessibility. I have a letter here from the Chamber of Commerce, the Associated Retailers, and the Advertising Club, guaranteeing publicity. Those are formal invitations. I have some telegrams here which I will read. One is from Dr. Jenneman, another from Dr. Huggins, who is the veterinarian for the St. Louis National Stock Yards.

(Mr. Hatfield read the telegrams.)

I see here a group of men that ought to be ten times as big as it is. When you go to extreme points in the country a great many can not attend. Denver has wonderful weather, wonderful hospitality, they know how to entertain, and they have the mountains. We can't move the mountains to St. Louis. I am not making any invidious comparisons, but if you watch the

thermometer you will find that the thermometer of St. Louis has run from two to three degrees less than Chicago and other cities around there. It costs money in these times to travel. With the railroad rates up you want to get a central point which does not take so much money. We have had 369 conventions whose attendance we have increased from 25 to 30 per cent because they selected a central city.

The one thing I want to emphasize is our ability to take care of you. Pardon the personal reference, but I am President of the National Association of Convention Bureaus. I know what other cities are contending with in regard to conventions; they try to pattern as much as they can after our service. It is one thing to invite a convention to a city and quite another to have them all go away feeling that was the best convention they ever had.

Dr. Howard wrote me a letter and made the statement that they did not expect to have such service and such publicity anywhere until they came back to St. Louis in sixteen years. It was with his letter that I was successful in landing the American Bar Association.

Speaking of conventions, you know how careful the A. M. A. is. After four years I finally landed them. They are going to meet in St. Louis in the spring, in the last week in May.

We are taking care of conventions by giving a service that is twofold, first to build the attendance. I will spend any amount of money that your national officers will tell me is justified to build this attendance and get you new blood. I have met some of the fellows around here who are professional. I don't mean to criticize them. They are here representing other than what I would call the practitioners. It is all Greek to me, yet I hear a wonderful paper read here with less than a hundred people sitting here to listen to it. It is spread out through the technical journal.

To go back to the building up of attendance, we lay out a campaign after your formal notice has gone out to your members announcing where you have decided to hold your meeting, and we start in, subject to the approval of every word, so it will be ethical according to your standards. The Governor writes a letter on his stationery, we pay the postage, and it goes out of our office. We work that so that we may have series of a half dozen. We send those letters out to members and men who have not been to conventions for several years. The man gets a letter from the Governor of Missouri; that attracts his attention. A little later on he gets a letter from the Mayor, then from the Chamber of Commerce, then a local society, perhaps the stock yards. The psychology is really this: "Those fellows really want me! I am going to go!" Our publicity man will prepare cuts and material to go into your JOURNAL.

and other official publications several months before the convention, telling all about it.

You are not going to be overcharged in St. Louis. The hotels are the Statler, Jefferson, Planters, Marquette, etc. We whipped the hotels into line, and if one of them goes back on its promise not to advance rates during conventions, they don't get any more conventions until they make good.

(Mr. Hatfield read telegrams from the Hotels Planters, Jefferson, Claridge and Marquette.)

I want to emphasize that we have the service, we will give the publicity. Our publicity is ethical. Suppose we had your program a month or six weeks in advance, and saw that Dr. Smith of Atlanta, for instance, was going to read a paper. We would try to get from Dr. Smith a paragraph or two on what he was going to say. If you paid for all this publicity it would cost you a million dollars, a dollar a line, which is cheap publicity. Here you are, a constructive organization with wonderful ideas to sell; you want new members, new blood; you want to sell the idea of your organization to the public. We arrange a press room, and Capt. Tourron secures the papers from you, as far in advance as you can furnish them, and commences to put them through. You will censor it, of course. We will see that anything you release gets into the papers. The manager of every daily paper is a member of this bureau.

I do want to say a word about the ladies. You haven't enough ladies here. We have in St. Louis an organization headed by a lady who is the hospitality director and meets with local ladies and arranges the program of entertainment. If you bring the ladies you won't have to worry; your wives will be taken care of. (Applause.)

PRESIDENT WHITE: You have heard the invitation from the city of St. Louis. Are there any more representatives of any other cities who would like to be heard?

DR. JENSEN: We are invited to go to St. Louis. We haven't had a single veterinarian from St. Louis at a convention in some time. Mr. Hatfield has come directly from headquarters to invite you, and he spent money in coming. It would be a good thing to go there and stir up those veterinarians.

DR. ELIASON: I am afraid that it is useless to talk to this audience after it has been subjected to that much oratory. We don't come here inviting you to come to Madison entirely for selfish motives. We believe that we can do something for the organization. If I didn't honestly believe that I wouldn't ask you to come. I can't boast of the terribly extravagant accommodations that we can give you; I can't boast of a good many elaborate times we can give you; but I guarantee you this, if you come there: You will all have to work and get into the meeting, and feel, when you go back, that you have been to a real veterinary convention.

We assure you that if you come to Madison you will be taken care of and housed, and it will be at rates that any one can afford to live on. There will be no seven or eight-dollar-a-day hotels, but we will take care of you and we will give you accommodation that will amply house you and keep you comfortable while you are there.

DR. CONNAWAY: In talking these matters over with Dr. Jensen at the beginning of this meeting I felt somewhat as he did; but the presentation which Mr. Hatfield has made convinces me that for the best interest of our Association we ought to go to some place where we can get the very largest attendance and have that cooperation of a publicity man who will make it a success. With all the promises which Mr. Hatfield has made, and with his genius for getting crowds to St. Louis, I believe that we would have in that city next year one of the largest attendances we have ever had. Moreover, it would be close to where Dr. Kinsley would be, so he could cooperate, and where every other veterinarian that should have been here can be drafted into the service and made to work harder than any veterinarian ever worked before. We need more members.

DR. CRAIG: I move that the Association recommend to the Executive Board that we meet in Madison, Wisconsin.

(The motion was seconded by Dr. Bergman.)

DR. LOCKHART: Strike out the word "Madison" and substitute "St. Louis." I move to amend to that effect.

(The amendment was seconded.)

DR. CONNAWAY: I would move as a substitute that the house be divided and those in favor of Madison gather on one side and those in favor of St. Louis gather on the other side.

PRESIDENT WHITE: That is a good suggestion.

SECRETARY MAYO: I think that matter ought to be referred to the Executive Board with an expression of opinion. I am not a member of the Executive Board, but I am sure the Executive Board would take every factor into consideration and give it the most careful thought. They represent the country as a whole.

DR. STANGE: The most representative committee we have is elected by postal card ballot for a period of five years, and it seems to me that if we are going to follow the policy of letting small minority groups decide these questions we are going to have a hard time doing for the Association what we want to do.

DR. JAKEMAN: Is not this motion merely a recommendation to the Executive Board? Is it not in their hands finally to decide?

PRESIDENT WHITE: The Chair so understands.

DR. JENSEN: I don't believe I got that understanding from the minutes yesterday. Has it come to pass that this entire organization is destined to be handled by five men? Is the entire membership that is paying dues entitled to know what shall happen? I declare to you that executive committees are human and they make mistakes. They ought not to take the



privilege of the membership out of their hands and put it into the hands of a committee of five men. I have had some experience with the Executive Board. I had to go on the floor to fight a bunch, and I want to tell you I beat them hands down. I would not for one minute submit to the final vote of the Executive Board on the matter.

DR. CONNAWAY: In making my motion it was my understanding that the settlement of this should ultimately go to the Executive Board.

(Dr. Conaway's substitute motion was seconded and carried, and a standing vote was taken on each city. The result as announced by Secretary Mayo was 40 in favor of St. Louis and 46 in favor of Madison.)

SECRETARY MAYO: As I understand this, it is referred to the Executive Board as the expression of opinion, 46 being in favor of Madison and 40 in favor of St. Louis.

DR. JENSEN: May I ask the Secretary to read for the assembled people, as a matter of courtesy to them, the exact wording of that matter in the By-Laws?

(Secretary Mayo read the section in the By-Laws.)

DR. CONNAWAY: My intention was to get the expression of this small body. There are so few of us here to represent such a large body and to say where we should go, that my intention was that the ultimate settlement should be left with the Executive Board. Things may come up between now and the next meeting that would place the meeting in some other location altogether. What we want to work for is not for local interests, not for the boosting of Missouri or Wisconsin, but to do those things which will be for the best interests of our Association. We want to do those things that are going to increase our membership. The Secretary has called attention to that time and time again. That is what we need. We should go where we will derive the most benefit. If we can get it by going to Madison, by all means let us go there. If we can get it by going to St. Louis, let us go there. I think some central location where there is some big booster like this one who will go after every section of the country may be of help to us. Maybe Mr. Hatfield will help us even if it goes to Wisconsin.

MR. HATFIELD: Surely.

DR. JENSEN: Let us not hedge the issue. I should think that in all fairness we should consider only our own best interests. I want to be fair, even though you may think I am knocking my own State.

DR. SIMMS: At a recent joint meeting of the British Columbia Veterinary Association and the Oregon State Veterinary Association, a resolution was unanimously passed inviting the A. V. M. A. to meet in Portland, Oregon, in 1925. In that year there will be at Portland an international exposition, so we can get very favorable railroad rates. We feel we are due some con-

sideration from the Association. We have a good many members of the A. V. M. A. out in the Far West country, and the Association has never met in that section. Somebody will mention San Francisco, but the people north of that, miles and miles away, do not feel that you are meeting in their vicinity. Get up to British Columbia. We have good loyal members in those Northwest States, members who pay their dues and boost the Association. We have never had a meeting anywhere in our vicinity, and we are extending at this time an invitation coming not from the commercial clubs, not from the hotels, but from the veterinarians of the Northwest, who hope you may be able to get up there in 1925. (Applause.)

Adjournment.

### FRIDAY MORNING, SEPTEMBER 9, 1921

#### GENERAL SESSION

The meeting convened at 10:30 a. m., President David S. White presiding.

#### REPORT OF EXECUTIVE BOARD

PRESIDENT WHITE: We will now have the report of the Executive Board.

SECRETARY MAYO: Mr. President, we have one more application that came in last night of Alva C. Stein, graduate of the Ohio State University, College of Veterinary Medicine, 1911, properly vouched for and approved by the Board.

(Upon motion of Dr. Sisson, duly seconded, the application was accepted.)

#### REPORT OF COMMITTEE ON EMBLEM

PRESIDENT WHITE: There are a few committees yet to report. I will call for the report of the Emblem Committee.

DR. MCKENNA: Dr. Bennett has asked me to report.

(Dr. McKenna read the report of the Emblem Committee, as follows:)

Your committee has gone over the various drawings and suggestions which have been submitted to it, and recommends for adoption the emblem which has been adopted by the California State Veterinary Medical Association. The design for this emblem was drawn by Dr. H. B. Wintringham of Fresno, Calif., and is the caduceus with a superimposed V as used for collar ornament in the Veterinary Corps of the Army. This is placed in a maroon disc surrounded by a light band. The drawing as we are showing you here today is the exact size. This plate will have a metal border, inside of this a circle of white, hard enamel, and the center of the plate will be hard enameled in red with medical emblem and letter V showing in metal. The plates will have a 5-inch lug soldered on the back, which is long enough to extend clear through the radiator, and we will also furnish an iron washer and a wing nut for attaching. The metal parts of this plate will be finished in either brass or nickel plate, whichever is preferred.

One of the principal values these emblems will have will be for use on a member's automobile. Restrictive automobile legislation is constantly being enacted, and it is believed that our profession will be given the same recognition in regard to such legislation as time limit for parking automobiles in congested districts as is given members of the American Medical Association when their emblem is on a car.

The California State Association has taken the matter up with Bastian Brothers of Rochester, N. Y., the makers of the American Medical Association emblem, and has received the following quotation: Lots of 250 emblems, \$2.30 each; 350 emblems, \$1.90 each; 500 emblems, \$1.60 each. No doubt in larger quantities a better price could be obtained.

S. E. BENNETT, *Chairman;*  
JOHN F. MCKENNA,  
*Committee on Emblem.*

(A motion was made by Dr. Mayer, seconded by Dr. Fox, that the report be accepted.)

SECRETARY MAYO: I would like some information as to how this emblem is to be supplied. Is the Secretary to order them and supply them to the members?



Emblem Adopted by American Veterinary Medical Association

DR. MCKENNA: My idea in regard to this is that if the report of the committee is adopted a motion should be made on the floor in reference to how they shall be distributed.

(The motion to adopt the report was carried.)

DR. MCKENNA: In reference to the distribution of these emblems from the manufacturers, the Secretary of the State Association of California has so far had about fifty orders from the veterinarians in California. He has sent out a card, and his instructions from the State Association are that no one can secure this emblem unless he is a member of the Association. I believe that is the procedure in the A. M. A.; they are handled through the resident or the local secretaries, and unless a man is a member of the National Association he is unable to secure the emblem. I believe that rule would be a good one in this Association. It would perhaps stimulate membership in both sectional and State associations.

DR. HOSKINS: I believe it would be a good idea if the report of this committee would be published in an early issue of the JOURNAL. The Committee on Emblem might draw up some sort of an additional report outlining a probable way in which these emblems could be supplied, and through the Resident State Secretaries some idea could be obtained of exactly how many might be wanted. I believe that could be done much more rapidly through the JOURNAL than any other means of which I know.

SECRETARY MAYO: I would move that this be referred to the Executive Board with recommendations from the Emblem Committee. The Executive Board will meet in Chicago the latter part of November, and they have under consideration at that time various plans for increasing the membership of the Association, and I think that the Board could very properly devise a plan for distribution, with the suggestions from the committee.

(The motion was seconded by Dr. Fox and carried.)

#### REPORT OF BUDGET COMMITTEE

PRESIDENT WHITE: I will now call for the report of the Budget Committee.

(Secretary Mayo read the report of the Budget Committee, as follows:)

President's Fund.....	\$500.00
Intelligence and Education.....	1,000.00
Legislation .....	1,500.00
Salmon Memorial Fund, limited to postage and incidentals.....	50.00
Abortion Committee .....	500.00
Treasurer .....	300.00
Pharmacy .....	250.00
Anatomical Nomenclature.....	50.00

10 shares Horse Association of America ..... 50.00  
 Necessary running expenses of JOURNAL office at Washington and  
 expenses of Secretary's office.

D. S. WHITE,  
 M. JACOB,  
 N. S. MAYO,  
*Budget Committee.*

DR. HOSKINS: I move that the report be received and approved.

(The motion was seconded and carried.)

#### REPORT OF COMMITTEE ON ANATOMICAL NOMENCLATURE

PRESIDENT WHITE: I will now call for the report of the Committee on Anatomical Nomenclature.

DR. SISSON: In the absence of Dr. Murphey, the chairman, I will simply make a brief verbal statement to the effect that so far as I know no meeting of the committee has been held and consequently there is no formal report to be offered. I think it would probably be well to continue the committee, or at least a committee, in view of the fact that there is a proposition to have an International Committee on Nomenclature, and of course this body should have some representation on the National Committee or the International Committee.

PRESIDENT WHITE: You have heard the statement of a member of the Committee on Anatomical Nomenclature. It will require no motion.

#### REPORT OF COMMITTEE ON RESOLUTIONS

PRESIDENT WHITE: Is the Resolutions Committee ready to report?

(Dr. Jungerman read the report of the Committee on Resolutions, as follows:)

##### *Resolution<sup>1</sup>*

*Whereas*, There has recently been a renewal of activities in the United States against animal experimentation, under the misleading name of a campaign against vivisection,

*And whereas*, Many false statements have been made to the effect that medical men do not regard animal experimentation as of value and do not approve of it, and that such experimentations are cruel and unnecessary;

*Therefore be it Resolved*, That the American Veterinary Medical Association hereby places itself on record as favoring animal experimentation, and as expressing its belief that animal experimentation is of the highest value, that it has furnished us with a large part of our present knowledge, and that it is the only method by which we can hope to solve many of our present problems, to save our animals from suffering and humanity from economic losses among its livestock.

*And be it further Resolved*, That we condemn and disapprove the campaign for the prevention of animal experimentation and all measures to place the supervision of such investigation under persons without sound medical, veterinary or biological education and training.

<sup>1</sup>This resolution is given in the amended form as adopted.



*And be it further Resolved, That we condemn as false the statements to the effect that animal experimentation is cruel or provocative of cruelty, it being a matter of common knowledge among veterinarians that animals used for experimentation purposes are handled with care and kindness, are not treated cruelly, and are given anesthetics whenever necessary to prevent suffering.*

*Resolution*

*Whereas, The American Veterinary Medical Association, while in convention at the city of Denver, has received the assistance and hospitality of the local committee and veterinarians of Colorado, the civic authorities and other organizations of Denver, the Albany Hotel, the Denver Cab Company, and the Parl Floral Company:*

*Be it Resolved, That the Association hereby records its appreciation of the many courtesies extended and the assistance received from each and all of them, and that the thanks of the Association be extended to them.*

(A motion was made and seconded that the report be adopted.)

DR. JONES: The first resolution states that experimentation should only be by medical men and veterinarians. Of course under the supervision of medical men and veterinarians. Biologists use a great many more animals than either of us, and, of course, physiologists need not be medical men or veterinarians. I think that should be amended.

DR. JUNGEMAN: I think that reads that supervision should be maintained by men having medical training.

DR. MAURICE C. HALL: I think the suggestion is a good one. In drawing up this resolution I was writing rather hastily. It would be well to make that "of sound medical or veterinary scientific training," the idea being to head off the sort of supervision which is in vogue in England. The persons carrying on antivivisection campaigns have been sufficiently successful in England to hamper the work of animal experimentation very materially. Most people opposed to animal experimentation are doing it on sentimental grounds, and they have a supervision in England which is very restrictive, very injurious to English scientific research.

In this country we have had similar campaigns going on, and they will be going on in the future. Unless we take steps to head those campaigns off, American investigations of scientific medication in the biologic field will be hampered in the same way. There has been recently a fight in California on this subject. It has been brought up in the United States Congress a number of times, and very recently it has come up again. The veterinary profession, I believe, would be unanimous on this subject. I don't think it would be necessary to ask the A. V. M. A. to support this resolution. I have no doubt of their support, but I don't know that all of the members appreciate how very serious the situation is and how necessary it is that we combat in every possible way this propaganda to stop these experimentations. The men who are making the campaign are

putting it first on the basis of preventing experiments on dogs, but that is only a hindrance. When they have achieved that they will have stopped the experimentation entirely if they can.

In order to expedite the consideration of this resolution, I move that the Committee on Resolutions insert the word "biological" in addition to the words "medical and veterinary" in reference to supervision.

(The motion was seconded by Dr. Jones.)

PRESIDENT WHITE: This comes as an amendment to the report of the Committee on Resolutions by adding certain words in order to include the scope of those who indulge in this practice—namely, it would include biologists and other competent scientists.

(The amendment was carried.)

PRESIDENT WHITE: Now the question is on the original motion as amended.

(The report of the committee as amended was adopted.)

#### REPORT OF SALMON MEMORIAL COMMITTEE

PRESIDENT WHITE: We will now have the report of the Salmon Memorial Committee.

DR. MOHLER: In the absence of Dr. Brenton, I have been requested to present the report.

(Dr. Mohler read the report of the Salmon Memorial Committee, as follows:)

The report of the secretary-treasurer of the committee, the late Dr. W. Horace Hoskins, rendered at the Columbus meeting last year, showed that \$3,956.40 and one \$500 United States bond had been collected for the fund.

Since the 1920 report was made the sum of \$38 additional has been collected.

The funds that have been collected thus far have been placed on deposit in the Rittenhouse Trust Company of Philadelphia in the name of the Salmon Memorial Fund. This deposit bears interest, but your committee is unable to report at this time the exact amount of interest that has been credited to the account during the past year.

The will of the late Dr. W. Horace Hoskins, who was largely instrumental in the creation of the memorial to Dr. Salmon, and who has been so active in the collection of subscriptions to the fund, contained the following bequest:

"That the sum of \$100 be given to the Salmon Memorial Fund as a tribute to one of the most complete lives of unselfishness and true public service ever lived by any member of my chosen profession."

Your committee recommends that the Salmon Memorial Committee of this Association be continued, that an effort be made during the coming year to collect the balances of unpaid pledges, about \$5,500, and that the fund, or such part of it as may be deemed wise, be invested in Government bonds, the interest from these bonds to be made available as early as possible for the use of some worthy young man needing financial assistance in securing a veterinary education.

*Receipts, Salmon Memorial Fund, 1920-21*

Dr. J. Lebish.....	\$1.00
Dr. O. Howells.....	1.00
Dr. V. Carabba.....	1.00
Dr. D. F. Fox.....	10.00
California State Veterinary Medical Association.....	25.00
Total.....	<u>\$38.00</u>

S. BRENTON,

*Chairman, Salmon Memorial Committee.*

DR. EICHHORN: I move that the Association express its profound gratitude for the bequest of Dr. Hoskins.

(The motion was seconded and carried.)

DR. JAKEMAN: I move that the report of the committee be received.

(The motion was seconded and carried.)

## PRESENTATION OF PAPERS

PRESIDENT WHITE: That seems to conclude the reports of committees. We have two papers, one entitled "Inspection of the Fish Food Supply of the United States Army," by Major George Lytle. Major Lytle is not here. The second paper is "Maryland Plan for the Eradication of Hog Cholera," by Dr. R. C. Reed, of College Park, Md.

(Dr. Reed read his paper, which will appear in a later issue of THE JOURNAL.)

PRESIDENT WHITE: The next paper will be "Types of Bacillus Bovisepticus Encountered in a Dairy Herd," by Dr. Fred R. Jones, of Princeton, N. J.

(Dr. Jones read his paper, presenting it with illustrations on the board. The paper was published in THE JOURNAL for December, 1921, page 271.)

## PRESENTATION OF NEW OFFICERS

PRESIDENT WHITE: This concludes all of the papers. If there is no unfinished or new business, the next item will be the installation of officers. I will appoint Dr. Sisson and Dr. Goss to present the President-elect, Dr. Kinsley.

(Drs. Sisson and Goss conducted Dr. Kinsley to the chair.)

PRESIDENT WHITE: It is a pretty little custom which has come down to us through the years to have the outgoing President present to the incoming President a gavel, and a gavel with a history. This badge of authority was presented to this Association by the late W. T. Monsurat, of Honolulu, Hawaiian Islands, at the Minneapolis Convention in 1902. I believe this late member was known as Honolulu Bill. There is an inscription on this gavel, the meaning of which I do not know, but I assume that it greets the incoming President with a wish of prosperity, the best of luck and the heartiest cooperation of the member-

ship of this Association. I trust that he will find his service as pleasant and as inspiring as mine has been. I hope also that he will receive your courteous treatment, hearty cooperation, respect and helpfulness that I have received. Dr. Kinsley, permit me to present this gavel. (Applause.)

DR. KINSLEY: Mr. Chairman, Gentlemen of the Association, I first wish to thank you cordially for the honor you have conferred upon me. In accepting the executive position of this Association I am not unmindful of the obligation that I will have to meet. I am going to ask each and every one of you, as members, committeemen and officers of this Association, to assist, help and cooperate in every way in making the coming season one of the best Association years we have had. (Applause.)

PRESIDENT WHITE: Permit me to install and introduce two of the five Vice-Presidents, the First and Second. I don't know where the other three are. A member remarked to me at this meeting that we had too many Vice-Presidents. I told him there was no evidence of that fact, as none of them was present. If you desire, and if these men are anxious to deliver themselves of a short oration on this occasion, we shall be glad to hear from them.

DR. LAMB: Mr. Chairman and Gentlemen, I am not going to try to inflict any address upon you, but I want to thank you for the honor conferred. I appreciate the fact that to be President of this Association is the highest honor that can be conferred on any veterinarian. Naturally I say that the office of Vice-President is the second highest honor, so I consider I have been elected to receive the second highest gift of the Association, and I appreciate it as such. At the same time I realize that this honor was not conferred upon me because my name happened to be Lamb. It was, I think, conferred upon the veterinarians of this district with me as their representative. I don't presume that the office of Vice-President will require any arduous labors on my part with such a man as President as Dr. Kinsley with his well-known ability and activity in all lines as we know him, but if occasion should require that any duty devolve upon me, I assure you I would be ready and willing to assume it to the best of my ability. (Applause.)

DR. McKENNA: Mr. Chairman and Gentlemen, I appreciate the honor of being elected Vice-President of this Association, and I assure you that the veterinarians of the Far West appreciate recognition in this Association. I assure Dr. Kinsley and the other officers of my hearty cooperation, and I will be glad to assist in any way I can in our part of the country. (Applause.)

(A motion was made, seconded and carried, to adjourn the convention *sine die*.)

(*Proceedings of section meetings will appear in February JOURNAL.*)

## EXECUTIVE BOARD MEETING

### ST. LOUIS GETS NEXT CONVENTION

At the meeting of the Executive Board of the A. V. M. A., held in Chicago on November 27, the Board voted that the 1922 meeting of the A. V. M. A. would be held in St. Louis, Missouri, and that the dates would be August 28 to September 1, inclusive.

In connection with the program for the next meeting the Board thought it advisable to have a two days' clinic to be in charge of the best operators that could be procured, the clinic to be devoted to diseases of cattle, hogs, dogs and poultry, together with general surgical subjects.

The Executive Board authorized President Kinsley to appoint a committee of three to cooperate with the National Formula Committee with reference to new and non-official veterinary remedies. President Kinsley appointed Drs. Brumley of Columbus, Klein of Philadelphia, and Milks of Ithaca, New York, the first named being chairman.

The question of the legality of the election of officers for the Sections on "Sanitary Science and Police" and "Education and Research" at the Denver meeting, was brought before the Board. The Board ruled that the officers of the section on "Education and Research" for the past year, should continue for the present year.

The Secretary was authorized to purchase 500 automobile emblems, and that these emblems were to be sold to members for \$1.25 each.

Treasurer Jacob made a report on the funds of the Association. The Board authorized Treasurer Jacob to purchase \$10,000 worth of American or Canadian Government bonds.

N. S. MAYO.

---

## IT WILL PAY

The Committee on Increasing Membership of the A. V. M. A., consisting of President Kinsley, Dr. Hilton, chairman of the Executive Board, Dr. Mohler, editor of the JOURNAL, and Secretary Mayo, held a meeting recently in Chicago.

It is planned to put on an active campaign to increase the membership, and it was decided that every member of the Asso-



ciation who is not an official will receive a rebate of \$1.00 on his annual dues for every application for membership that he sends in. Five new applications will pay the member's dues for a year. If he gets more than five the amount will be applied on the next year's dues.

Application blanks will be sent to any member who desires them, if he will drop a postal card to Secretary Mayo.

---

### **AN HONOR FOR THE A. V. M. A.**

The National Veterinary Society of Cuba, through its President, Dr. B. Crespo, has cabled an invitation to the A. V. M. A. to send a delegate to the Fifth Annual Medical Convention of Cuba. The delegate is to be the honored guest of the Cuban National Veterinary Association, who will pay all expenses of the trip to Cuba as well as all expenses during the week of the convention in Havana.

In response to this hospitable and generous invitation, President Kinsley has named Dr. R. P. Marsteller, of College Station, Texas, to represent the A. V. M. A. at this convention.

The Medical Convention of Cuba is composed of physicians, veterinarians, dentists and pharmacists. A splendid scientific and practical program has been arranged and we know that all members of the American Veterinary Medical Association will be much interested in the report that Dr. Marsteller will make of this splendid convention.

We feel sure that the A. V. M. A. will express its appreciation for the honor conferred by the National Veterinary Association of Cuba.

N. S. MAYO.

---

### **NOMINEES FOR EXECUTIVE BOARD**

The following are the nominees selected by postal card vote from among whom a member of the Executive Board will be elected to represent District No. 6:

- J. H. Bux, Arkansas.
- B. W. Conrad, Kansas.
- D. F. Fox, California.
- H. Jensen, Missouri.
- N. F. Williams, Texas.

### A. V. M. A. COMMITTEE APPOINTMENTS

President Kinsley has appointed Dr. James Robertson, of Chicago, a member of the A. V. M. A. Committee on History, to succeed Dr. R. C. Moore, who resigned.

President Kinsley has appointed Dr. J. P. Turner, 918 O street northwest, Washington, D. C., and Dr. R. R. Clark, Newport News, Va., a committee of the A. V. M. A. to cooperate with similar committees representing medicine, dentistry and pharmacy, in the preparation of a model Federal Narcotic Law or a revision of the present law. The committee will gladly receive any suggestion from the profession regarding this matter.

---

### UNITED STATES LIVE STOCK SANITARY ASSOCIATION

The twenty-fifth annual meeting of the United States Live Stock Sanitary Association was held at the La Salle Hotel, Chicago, Illinois, November 28, 29 and 30. This annual event is growing in interest and importance each year. It is estimated that notwithstanding the fact that it was International Livestock Exposition week and the meetings of the National Association of Commissioners, Secretaries and Departments of Agriculture, and the National Association of Marketing Bureaus were scheduled to take place at the same time, and that the Illinois Veterinary Medical Association also was to meet in Chicago on December 1 and 2, there were in attendance over 400 veterinarians, U. S. Bureau of Animal Industry officials, State regulatory authorities, livestock breeders and others. An excellent program was prepared for the occasion and it was notable that with two exceptions all whose names appeared on the program responded when they were called.

President W. F. Crewe called the meeting to order and requested Mr. H. R. Smith, Livestock Commissioner of the Chicago Livestock Exchange, to deliver the address of welcome in the absence of Dr. John Dill Robertson, Commissioner of Health, who was expected to welcome the members of the Association to Chicago on that occasion. Commissioner Smith ably performed this unexpected assignment, and Hon. J. H. Mercer, Livestock Commissioner of Kansas, responded in the pleasing manner for which he is noted. In a very earnest and timely address, President Crewe referred to the establishment of the as-

sociation, its development, its progress, and some of the problems that now confront it and the livestock industry. During the remainder of the first session, the report of the Committee on Legislation was presented by H. R. Smith, chairman, and a period was devoted to a memorial for the only departed member, Dean W. Horace Hoskins; Dr. J. I. Gibson, of Bloomington, Ill., led in the 'memorial exercises. Dr. J. F. DeVine and Major Charles Jewell delivered appropriate eulogies on the life and work of Dr. Hoskins, who will be remembered as a man among men, as a successful practitioner and educator, and for his zealous, untiring efforts to advance the veterinary profession to a higher plane of usefulness, respect and recognition. The afternoon of the first day was devoted to a joint session of the U. S. Live Stock Sanitary Association, the National Association of Commissioners, Secretaries and Departments of Agriculture, and the National Association of Marketing Bureaus, with Hon. Alva Agee, Secretary of the New Jersey Department of Agriculture, in the chair. At this session the association was honored by an address from Hon. Henry C. Wallace, Secretary of Agriculture. Immediately following the address of the Secretary, Hon. Fred Rasmussen, Secretary of the Pennsylvania Department of Agriculture, Mr. A. J. Glover, editor of *Hoard's Dairyman*, and D. V. Moore of Iowa, addressed the assemblage on the "Value and Desirability of a Joint Session Yearly of the U. S. Live Stock Sanitary Association with Other Bodies Represented."

Dr. O. H. Eliason, State Veterinarian of Wisconsin, read a paper on the subject of "Live Stock Regulations at Fairs and Expositions, with Special Reference to Accredited Herds," and Dr. J. A. Kiernan, Chief of the Tuberculosis Eradication Division, B. A. I., expressed his views on "What Commissioners of Agriculture Can Do to Assist the Tuberculosis Eradication Movement." The discussion of these papers was ably led by Hon. D. M. Davidson Director of Agriculture, Springfield, Illinois; Hon. H. H. Halladay, Commissioner of Agriculture, Lansing, Michigan; Hon. C. P. Norgord, Commissioner of Agriculture, Madison, Wisconsin; and Hon. E. C. Brigham, Commissioner of Agriculture, St. Albans, Vermont. It was a mutual pleasure and benefit for the members of these closely allied associations to meet in joint session. This joint meeting afforded an opportunity to become personally acquainted and more familiar with the relation of these organizations to each other and

the work each is doing on problems in which all are interested. The trend of the discussion plainly indicated a consensus of opinion that as these organizations hold their annual meetings about the same time, arrangements should be made for a joint session each year.

The first session on the second day was devoted to abortion disease among animals. Dr. W. L. Williams, Emeritus Professor of Veterinary Medicine, Cornell University, Ithaca, New York, read a paper on "Suggestions for the Improvement of the Reproductive Efficiency of Cattle." Dr. E. C. Schroeder, Superintendent of the B. A. I. Experiment Station, Washington, D. C., read a paper on "Bureau of Animal Industry Investigations on Bovine Infectious Abortion," and Dr. T. H. Ferguson, a veterinary practitioner of Lake Geneva, Wisconsin, who has given the subject much study, read a paper on "Herd Control of Infectious Abortion in Cattle." The papers read by Dr. Williams and Dr. Schroeder were among the most prominent features of the meeting, both on account of the recognized standing of the authors in the field of research and the scientific and economic importance of their subjects. The discussion that followed the reading of the papers commanded more than ordinary attention, owing to the participation by men prominent in their special lines, among whom were Dr. C. P. Fitch, Chief of the Division of Veterinary Medicine, University of Minnesota; Dr. Adolph Eichhorn, Director of the Veterinary Department of the Lederle Antitoxin Laboratories, Pearl River, New York; Dr. Ward Giltner, Professor of Bacteriology and Hygiene, Michigan Agricultural College; Dr. Edward A. Cahill, Director of the Pitman-Moore Laboratories, Indianapolis, Indiana; Dr. George Dick, Professor of Animal Industry at the Veterinary Department, University of Pennsylvania; Dr. J. W. Connaway, Professor of Veterinary and Comparative Medicine, University of Missouri; Dr. C. E. Cotton, State Veterinarian of Minnesota; Dr. J. G. Ferneyhough, State Veterinarian of Virginia; and Dr. C. W. Eddy, Veterinarian for Tellings-Belle Vernon Company, Cleveland, Ohio.

At the afternoon session on the same day, Dr. Eichhorn spoke on "Control of Anthrax by Simultaneous Treatment"; Dr. W. J. Butler, State Veterinarian of Montana, discussed "Methods of Eradicating Scabies in Sheep"; and Dr. James S. Healy, the B. A. I. representative in cooperative tuberculosis eradication

work in Wisconsin, addressed the association on the "Methods by Which Tuberculosis is Spread" among animals.

The forenoon of the last day of the meeting, November 30, was devoted to the consideration of swine diseases. Dr. C. H. Stange, Dean of the Iowa State Veterinary College, presented the Report of the Committee on Infectious Swine Diseases; Dr. U. G. Houck, Chief of the Division of Hog Cholera Control, B. A. I., Washington, D. C., presented the Report of the Committee on Interstate and Intrastate Shipment of Swine, and in the absence of Dr. T. P. White, Dr. W. T. Spencer, Livestock Commissioner, Omaha Livestock Exchange, presented the Report of the Committee on Hog Cholera Control. Dr. M. Dorset, Chief of the Biochemic Division of the Bureau of Animal Industry, gave a very interesting and instructive talk on swine diseases in which he informed the association of the results of his experiments with *suipestifer bacterins*. Dr. Edward A. Cahill read an interesting paper on "Factors Influencing the Control of Swine Diseases," which was discussed by Dr. George E. Corwin, Commissioner on Domestic Animals, Hartford, Connecticut, and Dr. B. F. Edgington, State Veterinarian of Ohio. Dr. A. T. Kinsley, Deputy State Veterinarian of Missouri, and Dr. W. W. Dimock of the Department of Veterinary Science, Kentucky Agricultural Experiment Station, led in the discussion of Dr. Dorset's experiments. The reports of the Committee on Swine Diseases resulted in the most spirited discussion that occurred during the meeting. Dr. Kinsley's criticisms of the Report of the Committee on Infectious Swine Diseases were met by prompt, vigorous retorts from the members of the committee. Both the criticisms and the replies were appreciated, especially by the members who were interested in the differential diagnosis and treatment of swine diseases.

The last session of the meeting was devoted to the reports of committees and the election of officers. The Committee on Resolutions presented three resolutions, in effect as follows:

That, in the production of milk, whether for consumption in cities or in rural homes, the tuberculin testing of cattle should be by all means insisted upon as an indispensable measure of preventing the dissemination of tuberculosis.

That, in view of the necessity of conserving State and Federal indemnity funds, we heartily commend the action of the Institute of American Meat Packers in recommending that all pack-



ing companies and local butchers pay as much for reacting cattle that pass food inspection as for healthy cattle of the same quality sold on the open market, and urge also that conservative appraisal be made on all reactors.

That the association unqualifiedly endorse and recommend that the strictest attention be given to the conservation of all funds appropriated by counties, States and Federal Government, and any other agencies contributing to the tuberculosis eradication campaign.

A motion was passed giving the Executive Committee authority to change the dates of the meeting if it deems advisable, to commence on Wednesday of the week of the International Livestock Exposition instead of on Monday as in the past.

Another motion was passed that an evening be designated during next year's meeting for a joint session with the National Association of Commissioners, Secretaries and Departments of Agriculture, and National Association of Marketing Bureaus.

The convention passed an amendment to the accredited herd plan which permits accredited veterinarians to make the preliminary tests of herds in the process of accreditation, no indemnity to be paid by the Government for cattle condemned in such tests. After the herd has shown one clean test the final test must be official and must be a combination test by the subcutaneous, intradermic and ophthalmic methods. This will permit of greater speed in the work without lowering either efficiency or thoroughness.

In connection with the report of Dr. L. E. Northrup, chairman of the Committee on Finance, a motion was passed in effect that the matter of publishing the Report of the Twenty-fifth Annual Meeting of the Association be left to the Executive Committee of the organization and that the committee be authorized to borrow money, if necessary, to have the report published, and in case of a deficit, to report it to the association at the next meeting.

The election of officers for the coming year resulted as follows: President, Dr. T. E. Munce, State Veterinarian of Pennsylvania, Harrisburg, Pennsylvania; vice-presidents, Dr. W. C. Simmons, State Veterinarian of Kentucky, Frankfort, Kentucky; Dr. B. F. Davis, State Veterinarian of Wyoming, Cheyenne, Wyoming; Dr. Edward Records, Director of the Nevada State Veterinary Control Service, Reno, Nevada; Hon. J. H. Mercer, Kansas

Livestock Commissioner, Topeka, Kansas; Dr. O. H. Eliason, State Veterinarian of Wisconsin, Madison, Wisconsin; secretary, Dr. O. E. Dyson, 5451 Woodlawn Avenue, Chicago, Illinois.

At present the membership of the U. S. Live Stock Sanitary Association numbers 825, including 31 admitted at the last meeting. It seems that the small membership is probably due to the fact that many veterinarians and others are laboring under the mistaken impression that only those engaged in national or State regulatory work are eligible to membership. Section 5 of the Constitution of the association reads as follows:

"Any person engaged in livestock sanitary work for Federal, State, Territorial, county or municipal governments shall be eligible to membership in this association, and any other person interested in livestock sanitation may be elected to active membership upon the recommendation of the executive committee and a two-thirds vote of the members present."

The membership is much lower than it should be considering the purposes of the association. Each member should regard it a personal duty to put forth earnest efforts during the coming year to increase the enrollment in this useful and important organization.

---

### A SUCCESSFUL TUBERCULOSIS ERADICATION CONFERENCE

The Tuberculosis Eradication Conference of State, County, Municipal and Federal Employees engaged in tuberculosis eradication work and others interested in the livestock industry, which was held in Chicago, Illinois, on November 25 and 26, 1921, was unusually successful. This is evidenced by the very large attendance of 560 persons, who maintained their interest throughout the various sessions. A well arranged program was offered, commencing on the morning of the first day with an address of welcome by the Honorable B. M. Davison, Director, Department of Agriculture, Springfield, Illinois. Following this, Dr. John R. Mohler, who presided, explained the objects of the conference and described some of the activities that should receive most careful consideration. Following this, Dr. E. C. Schroeder, Superintendent of the Experiment Station of the Federal Bureau, gave an interesting résumé of the experimental work conducted at the station relative to the problem of

controlling bovine tuberculosis. Dr. W. F. Crewe, President of the U. S. Live Stock Sanitary Association, followed with a pointed argument relative to cooperation between all of the parties interested in the total eradication of the disease.

At the afternoon session, Dr. L. Enos Day, of Chicago, Ill., gave carefully prepared statistics relative to obscure lesions in bovine tuberculosis and illustrated them by a series of beautiful mounted specimens. One of the most interesting talks of the session was that presented by Mr. A. J. Glover, Editor of *Hoard's Dairyman*, who spoke on "The Editor and the Breeder." Mr. Glover's talk was well received, as he has both personally and editorially forwarded the movement in every way possible.

Dr. G. E. Corwin, Deputy Commissioner on Domestic Animals, of Connecticut, speaking on the specifications under which the intradermic test should be made, gave statistics relative to delayed reactions following the injection of tuberculin by this method. Considerable discussion followed this paper, which resulted in a motion by Dr. W. J. Butler, of Montana, that the question of the technique and comparative reliability of this and other methods of tuberculin testing be referred to the Bureau of Animal Industry with the view of obtaining extensive statistics for presentation at the next year's conference.

Mr. James Brown, a breeder of Shorthorn cattle, gave a practical talk from the viewpoint of the stock raiser, on the eradication of tuberculosis from a purebred herd. Another talk of much interest to the conference was that of combination tuberculin test methods by Dr. L. B. Ernest, of the Federal Bureau. The last speaker of the afternoon session was Dr. Isaac Abt, Professor of Pediatrics, Department of Medicine, Northwestern University, who spoke on clinical studies relative to tuberculosis of children. This address was of more than usual instructiveness because of the new facts presented by one recognized as an authority, and also because of the firm stand taken on the danger of bovine tuberculosis to children.

On the morning of the second day, Dr. J. G. Ferneyhough, State Veterinarian of Virginia, gave a very interesting talk on the results obtained by returning accredited herds to the accredited veterinarian. Mr. Thomas Wilson, President of the Institute of American Meat Packers, through his representative, Dr. Fred Eagle, contributed a well prepared paper concerning the economic importance of eradicating tuberculosis. Follow-

ing this, Mr. Everett C. Brown, President of the National Live Stock Exchange, through his representative, Professor H. R. Smith, gave interesting data to show the interest his organization had in the completion of this nation-wide problem. Hon. E. S. Brigham, Commissioner of the Vermont Department of Agriculture, spoke on the subject of 27 years' experience with tuberculin testing, and showed the possibilities of an intensive campaign, once it is properly organized and started. The breeders of purebred cattle were again heard from through Mr. L. A. Campbell, President of the American Aberdeen-Angus Breeders' Association, who told of the advantages of an accredited herd. Following Mr. Campbell, Dr. C. E. Cotton, Secretary, Live Stock Sanitary Board, St. Paul, Minn., gave information relative to the progress of the control work in his State.

At the afternoon session Dr. D. F. Luckey, State Veterinarian of Missouri, told of the progress of the work in that State, where at the present time they have 20 counties under the area plan of eradication. This was followed by a talk from Dr. T. S. Rich, inspector in charge of tuberculosis work in Michigan, who gave the details of the recent intensive area campaign conducted in Hillsdale County, Michigan. Dr. M. Jacob, of the University of Tennessee, submitted a report of his committee relative to the plans for establishing tuberculosis-free areas. Of especial interest to the official livestock sanitarians present was the address of Dr. J. G. Townsend, veterinary practitioner of Racine, Wis., who gave a clear and definite opinion of the place the general practitioner should occupy under the accredited-herd plan. The most instructive and probably the most important address of the entire conference was that presented by Dr. W. A. Evans, of the Health Department of the Chicago *Tribune*, who spoke on Why Health Departments Are Interested in the Eradication of Bovine Tuberculosis. Dr. Evans' conclusions were of such importance and so well presented as to meet the needs of those in attendance at the conference better than any other similar material which has been afforded those engaged in the movement. The following quotation from his talk is of such vital importance to both the medical and the veterinary professions as to lead to its being given great prominence. He stated: "The relationship between the human and bovine tubercle bacilli leads health departments to the opinion that while programs for the repression of human tuberculosis, which

take no note of tuberculosis in other animals, may be successful, the time to strike for repression of human tuberculosis can not come until the program for control of bovine tuberculosis is well advanced." This is food for thought for all interested in the control of the Great White Plague. A rising vote of thanks was extended to Dr. Evans for his interest in contributing so largely to a successful conference.

Mr. H. E. McCartney, County Agent, Harlan, Iowa, spoke on the County's place in the tuberculosis eradication campaign, and gave interesting facts concerning how the movement was promoted in his county. The conference concluded with a synopsis of the report of the Committee on Tuberculosis of the United States Live Stock Sanitary Association by the Chairman, Dr. T. E. Munce, State Veterinarian of Pennsylvania.

The Advisory Committee of the Tuberculosis Eradication Convention, through its Chairman, Commissioner J. M. Whittlesey, presented the following resolutions, which were adopted:

*Whereas*, It has been established by incontrovertible investigations made by recognized authorities, that bovine tuberculosis is transmitted to the human family through the medium of milk and its products to such an extent that it must be recognized and prevented; and

*Whereas*, The eradication of bovine tuberculosis is for the twofold purpose of preventing the dissemination of the disease to the human family and to perpetuate the livestock industry upon a sound and healthful basis; be it

**RESOLVED**, That in the production of milk, whether for consumption in the cities or in rural homes, the tuberculin testing of cattle should be by all means insisted upon as an indispensable measure of preventing the dissemination of tuberculosis.

#### INTRADERMIC CODE

It is recommended that the first paragraph of the code for use in connection with recording the intradermic tuberculin test be amended to read as follows:

"The first observation should be made on or about the 72d hour after the injection. If it appears to the inspector making the test that more than a slight infection of tuberculosis is present in the herd, a second observation should be made on or about the 120th hour after the injection and if it appears necessary an observation should again be made on or about the 144th hour after the injection of the tuberculin.

"SECTION 1. That the requirements for tuberculosis-free area work be similar to the tuberculosis-free accredited-herd work and to be applied to all cattle located in said area.

"SECTION 2. That before any area shall be recognized as tuberculosis-free, after having complied with Section 1 of this resolution, there must be satisfactory assurance of official livestock sanitary police restrictions to prevent reinfection of said area."

#### SALVAGE AND APPRAISEMENTS

In view of the necessity of conserving State and Federal indemnity funds, we heartily commend the action of the Institute of American



Meat Packers in recommending that all packing companies and local butchers pay as much for reacting cattle that pass food inspection as healthy cattle of the same quality sold on the open market, and urge also that conservative appraisalment be made on all reactors.

#### INDEMNITY

The payment to the owner of indemnity for tuberculous cattle is a justifiable procedure which has the endorsement of this conference. However, we recognize that no practice should be continued which places any premium on diseased animals.

We unqualifiedly endorse and recommend that the strictest attention be given to the conservation of all funds appropriated by counties, States, the Federal Government, and any other agencies contributing to the tuberculosis eradication campaign.

Suitable resolutions, thanking the Chief of the Bureau for his promotion of the conference, were adopted. It was also decided to have all the addresses and papers, together with the discussions pertaining to them, published and distributed at the price of \$1.00. On November 27, the members of the conference visited the Union Stock Yards, for the purpose of witnessing the results of experimental tuberculin testing of 30 head of cattle by the subcutaneous and intradermic methods.

This demonstration concluded what was unanimously considered as the most instructive and successful tuberculosis eradication conference that has thus far been held.

---

### CONFERENCE OF RESEARCH WORKERS IN ANIMAL DISEASES

The third conference of State and National Research Workers in Animal Diseases was held at the Sherman Hotel, Chicago, Ill., on November 26, 1921, with the chairman, Dr. Marion Dorsét, of Washington, D. C., presiding.

Representatives from 20 States and from the United States Bureau of Animal Industry research divisions were present. The following program was presented: The Bacterial Flora of the Genital Tract of Cattle, by Dr. V. A. Moore; The Pathology of Sterility in Cattle, by Dr. E. T. Hallman; Infectious Abortion in Cattle, by Dr. C. P. Fitch; Experimental Immunization Against Icterohemoglobinuria in the Field, by Dr. Edward Records; Investigation of White Diarrhea of Young Chicks, by Mr. L. P. Doyle; Studies of Hemorrhagic Septicemia Sera, by Drs. L. Van Es and Martin; Botulism in Swine, by Dr. Robert Graham; Report of Committee on Infectious Colitis of Swine, by Dr. W. W. Dimock, Chairman; Report of Committee on Hog

"Flu," by Dr. Charles Murray, Chairman; The Precipitation of Tuberculin and the Preparation of Tuberculin Discs, by Drs. M. Dorset and J. A. Emery.

The objects of the conferences are to promote research in animal diseases by bringing into closer relation the various official agencies engaged in such activities. The conference elected Dr. C. H. Stange, of the Iowa State College, Chairman, and Dr. R. A. Whiting, of Purdue University, LaFayette, Indiana, Secretary for the year 1922.

---

### BRITISH COLUMBIA VETERINARY ASSOCIATION

I beg to submit the following as the annual report of the Association for the year ending August 17, 1921:

You will note that this is in the form of a letter this year, the usual book form being eliminated on account of expense.

Though the receipts for the association year were up to normal, expenses were greater on account of the larger attendance at the banquet and increased cost of printing.

I felt, however, that the members of the association who are unable to attend the annual meeting are still entitled to a report of the year's activities, and hope you will approve this economical method of sending them.

At the beginning of the year, in which I had the honor of being elected as your president, we held a most successful banquet in New Westminster, the Hon. Dr. S. F. Tolmie being in the chair. The toast list contained many prominent speakers, including Mr. G. Hutton, Chief of the Natural Resources Department of the C. P. R.; Hon. Mrs. Ralph Smith, M. P. P.; Mr. C. A. Welsh, president, New Westminster Exhibition; Mrs. Paul Smith, president of the local Council of Women, who made a speech that was most favorable to the veterinary profession. Members of Parliament, prominent stockowners and exhibitors were also present, together with the members of the association, making a total of over 60 people.

Favorable comment was heard on all sides afterward, and in the press regarding the successful manner in which the banquet was carried out, and I feel it will do the profession a great deal of good.

In regard to amendments to the B. C. Animal Contagious

Diseases Act, referring to the sale and use of tuberculin, which permits the use of tuberculin by laymen, the association sent a delegate to the Dairyman's Convention in Victoria, who brought the matter up. The Dairyman's Association honored this association by placing its delegate on the resolutions committee on the subject of tuberculosis.

We have been unable to get these amendments altered, the Deputy Minister of Agriculture, Dr. Warnock, being opposed, and he stated at the convention that the use of tuberculin by laymen in outlying districts should be permitted. A suggestion of a license in these rare cases he would not accept. The matter, however, is still before the association.

The question of the sale of tuberculous meat without inspection still occupies the time of the council.

I have pleasure in announcing that, partly owing to the efforts of this association, the Government has appointed a qualified veterinarian as Director of Veterinary Services for Canada.

On July 14 and 15 a very successful international convention was held in Seattle, Wash. Some 60 veterinarians from the States of Washington, Oregon, Idaho and the Province of British Columbia were present, and two days were fully taken up with professional business.

I feel proud of the large delegation that went from this association, and I took the opportunity on our behalf to invite the convention to meet with us next year in Vancouver, which was unanimously accepted.

An important resolution was introduced by us, which was carried, asking the veterinary colleges to give a post-graduate course to qualify veterinarians to act as veterinary health officers.

A contribution of \$25 was made to the Andrew Smith Memorial Fund, in lieu of a personal canvass of the members.

The question of the formation of a Canadian Veterinary Association has been before our profession a number of years. I think the time is fast approaching when such an association should be in operation, and I would recommend to the incoming council that a committee be appointed to interview the Hon. Dr. S. F. Tolmie on this subject on his coming visit to the Coast.

In conclusion, I would like to say to the members-at-large that the various activities of the association have for their object the betterment of the practitioner, by bringing the value

of veterinary science more before the general public and by pointing out to them the valuable services that the veterinary profession can render in any community.

T. H. JAGGER, *President.*

---

### NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS, METROPOLITAN DIVISION

A meeting of the Metropolitan Division, N. A. B. A. I. V., was held in the lecture room of the Veterinary College, New York University, 331 East 26th Street, New York City, October 21, 1921.

Twenty members were present, with President Dr. N. L. Townsend presiding.

Dr. A. McBride, Vice-President, who represented the division as delegate at the recent National Convention at Denver, presented a report on the proceedings at that convention. His report was complete, very interesting, and well received by the members. Dr. Townsend, former President, and now Vice-President of the National Association, also spoke interestingly of the convention. Among the subjects discussed at Denver, referred to by the speakers and of particular interest to the members, was that of reclassification. The reports were optimistic as to ultimate favorable action by Congress of a reclassification bill satisfactory to veterinarians and lay inspectors.

Dr. Townsend submitted a proposition at this meeting designed to revive interest of members in the Metropolitan Division. His plan in brief was that this organization should be made a real veterinary association whose object shall be to discuss not only Bureau work and welfare, but also veterinary or professional topics in general.

With this idea in view, the President announced that he had appointed a committee to be known as the "Program Committee," consisting of Doctors Albert Long, Robert M. Mullings, A. F. Martins and Leland D. Ives. The special aim and object of this committee would be to receive suggestions of members and to arrange and decide on programs of work to be taken up at the different meetings. The meetings of the Division, according to this plan, would be held regularly about once every two months, or oftener if desired by the members.

Dr. Long, chairman of this committee, reported that he had given some thought to the proposition as outlined and had requested suggestions of members. Among the suggestions offered for subjects to be considered at meetings were reading and discussion of papers on various subjects of special interest in connection with meat inspection and also other activities of the Bureau, such as tuberculosis eradication, tick eradication, hog cholera control, etc., as well as veterinary topics in general; presentation, demonstration and discussion on interesting or unusual pathological specimens found by inspectors in the course of their work at different establishments; discussions on the regulations, especially regulation 11, with the object of securing proper and uniform disposition of carcasses or parts at the various stations included in the Metropolitan Division.

It was emphasized by the chairman and other members of the Program Committee who addressed the meeting, that the success of this new plan depended on the active assistance and wholehearted cooperation of all members. Expressions of opinion given by the members present showed enthusiastic approval and augured well for the future success of the Metropolitan Division. Dr. Robert M. Mullings announced that he would start the ball rolling by reading a paper on "Technique of Postmortem Inspection" at the next meeting.

EDWARD L. SANDER, *Secretary*.

---

### ILLMO VETERINARY MEDICAL ASSOCIATION

The seventeenth semi-annual meeting of the Illmo Veterinary Medical Association was held October 28, 1921, in the auditorium of the Jno. T. Milliken Drug Co., St. Louis, Mo. Although the attendance was not so great as at some of the past meetings the enthusiasm exhibited was highly satisfactory. The visit through the pharmaceutical plant of the drug company, concluding in their cafeteria, was interesting and pleasing.

New officers elected were as follows: M. J. Huggins, National Stock Yards, Ill., President; C. B. Michaels, Evansville, Ill., Vice-President; L. J. Miller, Waterloo, Ill., Treasurer; L. B. Michael, Collinsville, Ill., Secretary. This association went on record with a strenuous resolution to secure the A. V. M. A. Convention for St. Louis, Mo., in 1922.

L. B. MICHAEL, *Secretary*.



### SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION

The Schuylkill Valley Veterinary Medical Association held a well-attended meeting at Leesport, Pa., on Wednesday, November 16, 1921. A clinic was conducted at Dr. O. B. Rahn's hospital, at which a number of operations on small animals were performed. The meeting was continued in the town hall, where papers were read by Dr. V. G. Kimball, of the University of Pennsylvania, on "Colics," and by Dr. U. S. G. Bieber, Kutztown, Pa., on "Distemper." The next meeting of the association will be held at Reading, Pa., on December 21, 1921.

R. L. BERGER, *Secretary.*

---

### PHILADELPHIA VETERINARY CLUB

The regular monthly meeting of the Philadelphia Veterinary Club was held November 22, 1921, at the Veterinary School of the University of Pennsylvania.

Dr. F. S. Jones, Rockefeller Institute, Princeton, N. J., addressed the Laboratory Section on "An outbreak of pneumonia in dairy cows attributed to *B. bovissepticus* and types of *B. bovissepticus* encountered in a dairy herd."

There was also an interesting discussion on abortion and retained placenta.

The Club went on record as endorsing the intradermic test and recommended that the accredited veterinarian be given more recognition.

The meeting was well attended.

C. S. ROCKWELL, *Secretary.*

---

### SOUTHEASTERN STATES VETERINARY MEDICAL ASSOCIATION

The next meeting of the Southeastern States Veterinary Association will be held February 6 and 7, 1922, at Nashville, Tenn.

An interesting program is being arranged, a copy of which will appear in the next issue of this JOURNAL. Some of the very best scientists and practitioners will give discussions on current problems.

All qualified veterinarians in the Southeastern States and adjoining States are urgently requested to attend this meeting.

With your support the convention should prove to be the best one that the association has ever had.

Any information concerning the program or meeting will be given through the Secretary or other officers of the association.

JNO. I. HANDLEY, *Secretary*.

---

### CENTRAL MICHIGAN VETERINARY MEDICAL SOCIETY

A meeting of the Central Michigan Veterinary Medical Society will be held in Jackson, Mich., at the Jackson City Club on Friday, January 6, 1922.

W. N. ARMSTRONG, *Secretary*.

---

### MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION

Elaborate plans have been made for the entertainment of the members and friends of the Mississippi State Veterinary Medical Association which will hold its Sixteenth Annual Convention at Gulfport, Mississippi, January 23 and 24, 1922. The association has departed from its former two-day session and will devote the second day of the coming convention entirely to getting acquainted and enjoying the sights and pleasures of Mississippi's winter playground.

The wives and sweethearts of the members and friends will be in attendance and an appropriate banquet will be given in their honor.

While the number of veterinarians in this State is not large, they are good association workers and have generally succeeded in having in attendance some of the best talent available. The last annual convention, which was held at Canton, Miss., was honored by the presence of Adolph Eichhorn, M. Jacob, C. E. Salsbery, and J. A. Kiernan, all nationally known veterinarians, and it is expected that several of these men will be with us at Gulfport and also a number of others of equal note.

J. A. BARGER, *Secretary*.

---

### COLORADO VETERINARY MEDICAL ASSOCIATION

The next meeting of the Colorado Veterinary Medical Association will be held at 1525 Curtis Street, Denver, Colorado, on Thursday, January 19, 1922.

I. E. NEWSOM, *Secretary*.

## EXAMINATION FOR ACCREDITED VETERINARIANS

The next examination for graduate practicing veterinarians who desire to qualify so that they may apply the tuberculin test to cattle under the provisions of the uniform accredited-herd plan, will be held January 24, 1922, in certain States where such an examination has been requested by the State livestock sanitary authorities. Veterinarians who are not already "accredited" and who desire to avail themselves of this examination should indicate it by notifying the official in charge of livestock sanitary work in their State.

---

## MISSOURI VALLEY VETERINARY ASSOCIATION

The winter meeting of the Missouri Valley Veterinary Association will be held at the Hotel Baltimore, in Kansas City, January 31 to February 2, inclusive.

R. F. BOURNE, *Secretary.*

---

## AMERICAN LEGION ADOPTS TUBERCULOSIS RESOLUTION

The following resolution was adopted by the American Legion at its recent convention in Kansas City, Mo..

WHEREAS, the veterinary profession engaged in the alleviation of suffering and disease among livestock of this country contributed to the successful outcome of the late World War and is represented in this body, and

WHEREAS, a goodly number of those engaged in this profession are actively carrying on the accredited herd plan of bovine tuberculosis eradication instituted by the United States Department of Agriculture in cooperation with nearly every State in the Union, and

WHEREAS, Bovine tuberculosis is readily communicated to children by milk from tuberculous cows, and

WHEREAS, the death rate from tuberculosis exceeds the toll claimed by the World War; therefore be it

RESOLVED, That the work of tuberculosis eradication in the herds of cattle and swine now started in 45 States in cooperation with the United States Department of Agriculture be continued, and be it further

RESOLVED, That adequate appropriations be made by Congress to carry the completion of this work of tuberculosis eradication to the consequent health and well-being of this and future generations.

D. W. SHAFFER, *Chairman.*



## COMMUNICATIONS

### INVITATION TO CUBAN MEDICAL CONGRESS

*President American Veterinary Medical Association,*

*Dear Doctor:*

We beg to confirm the cablegram sent today to your Association, which reads as follows:

"A Fifth Annual Medical Congress, formed by 2,000 physicians, dentists, veterinarians, pharmacists, will be held in Havana from December 11 to 17. Last meeting Cuban Veterinary Association decided to invite member American Veterinary Association as guest of honor, paying all expenses trip and stay in Havana during week of Congress. Similar invitation extended European and American physicians by Congressional Committee. Extensive scientific and social program. Cable name of delegate, details by mail. Dr. B. Crespo, President, Veterinary Association."

The motives that have inspired the invitation that the National Veterinary Association of Cuba unanimously agreed to extend to your distinguished association in an extraordinary session celebrated the 10th inst., were to initiate an exchange of ideas and social relations between the Cuban Veterinarians and their colleagues in North America. The intellectual, commercial and political relations of the two countries being so closely united, we wish to take advantage of the opportunity offered by the coming National Medical Congress of Cuba, to express, in the person of the delegate that your Association may appoint, the consideration, appreciation and fellowship that we feel for your association and its distinguished members.

We follow with much interest the work and investigations of our brother veterinarians in the United States, and the progress made due to their untiring efforts. We only lament that owing to several difficulties that have arisen which prevented the setting of a definite date for the congress, this manifestation of our good wishes for our brother association has been so long delayed.

Nevertheless, we will consider it a great honor if you accept this invitation and will endeavor in every way possible to make the stay of your representative here in Havana a pleasant one.

We have been informed that some of the other invited dele-







gates will present scientific articles, and we hope your delegate will favor us with one likewise, which we know will prove interesting.

We trust that as soon as your delegate has been appointed you will advise us in time of the date of his leaving, so that we may meet him on his arrival here and arrange for the other details in connection with the arrival of a guest of honor.

We beg to advise that the first session of the congress will be held on the evening of December 11.

Awaiting the reply of your association to our invitation, in the name of the National Veterinary Association of Cuba, I beg to remain with best wishes,

Very truly yours,

ANGEL IDUATE, *Secretary.*

BERNARD J. CRESPO, *President.*

Havana, Cuba.

Dr. Ross P. Marsteller of College Station, Texas, was appointed by President Kinsley as the delegate of the A. V. M. A. to attend the Cuban Congress. Dr. Marsteller telegraphed President Kinsley that because of serious illness in his family he was unable to attend the Congress. President Kinsley then appointed Dr. A. Eichhorn of Pearl River, N. Y., to represent the A. V. M. A. at this meeting.

---

## BOOST PUREBRED STOCK AND USE THE HORSE

*To the Editor:*

I have been reading with interest in the various veterinary bulletins and the JOURNAL of the number of the profession who are either in the purebred business directly or are advocating it to the farmers.

In my opinion there is nothing more befitting and interesting to the veterinarian as a side line than the breeding of either purebred or standard-bred stock or fowls. Even though it be on a small scale it will attract attention and inspire others with the desire.

The veterinarian should be an authority in his locality on breeds and breeding, that he may wisely and correctly advise those who seek such information. He should be keenly interested in the promotion of the breeding of better animals of all

breeds, also the promotor of any activity that will encourage the use of the horse, such as riding and driving clubs, polo playing, hunt clubs, etc. There is certainly no cleaner, better and invigorating sport than the use of the pleasure horse, either ridden or driven.

I am wondering how many of our profession have made an honest effort to sustain the horse? I have never allowed myself to discard him. While I, like the rest, have taken to the use of the auto (but for work only) I still keep my horse and the best I can get, using him every day when footing is good, in my downtown work. I find it a pleasure and a rest to get from behind a wheel and take hold of a real live one, either to ride or drive, and there is nothing that attracts more attention than a good horse—it's a good advertisement.

Why can we not, as a profession, give our best friend, the horse, a world-wide boost by using him for pleasure or business? I believe it will do more to bring him back than anything and the profession certainly owes it to him. I have never been in a community where there were not enough "horsey" people to start some kind of a riding or driving club.

Volumes have been written to boost the auto by those financially and otherwise interested. What have the veterinarians done to hold or promote the horse? He is one of their best assets in practice, aside from professional pride. Let us make a concerted effort to recover and "hold our own."

THOS. S. HICKMAN.

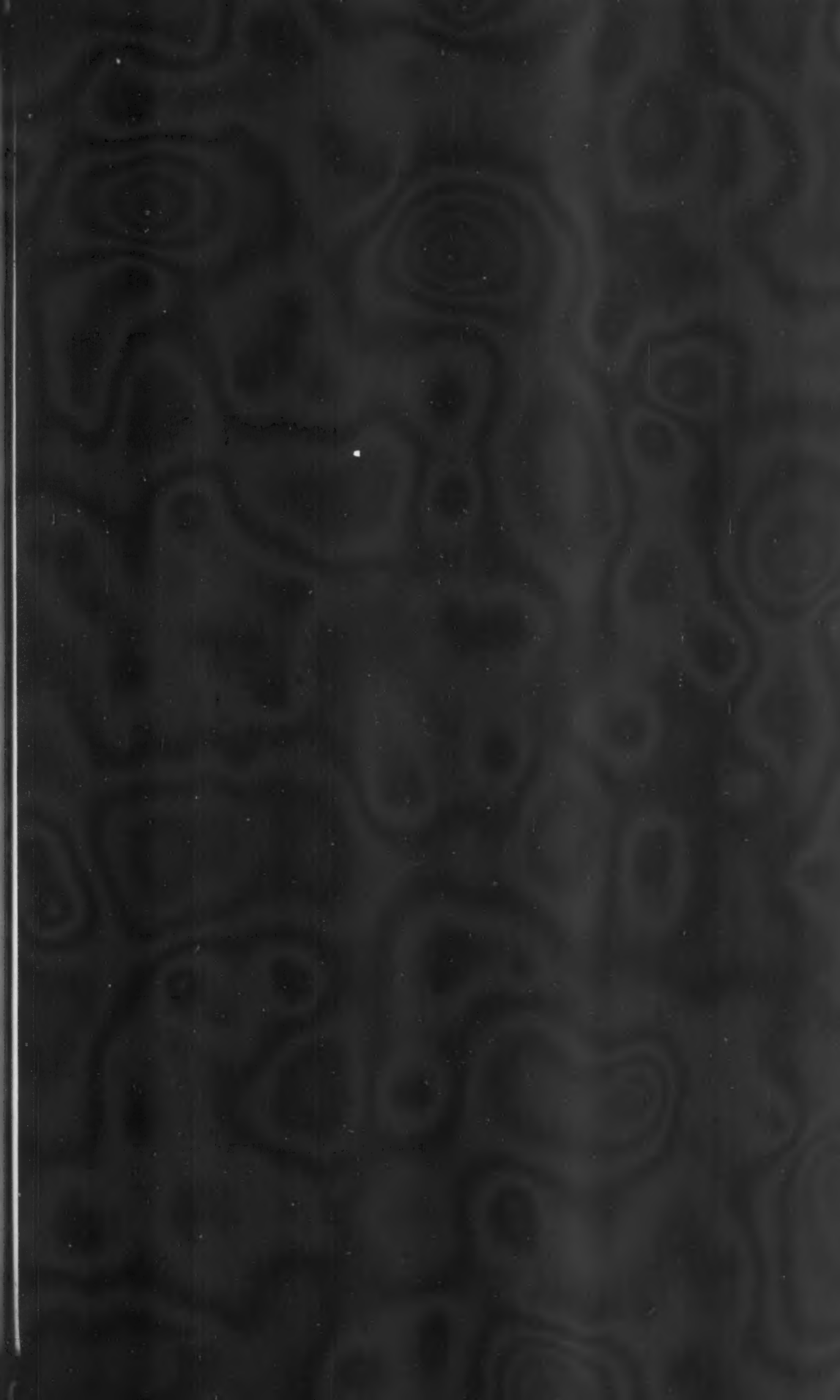
Sacramento, Calif.

---

Dr. J. N. Hornbaker, who has been stationed in Manila, P. I., for some time, writes that he is leaving for the United States, but does not know where he will be located.

---

Capt. D. B. Deininger of the Veterinary Corps, who is stationed at Camp Jones, Douglas, Arizona, made a splendid record in a horse show that was held there on November 19. He won one blue, one red and one yellow ribbon with the same horse entered in all three classes. He won first in the zig-zag jumping course, second in the four-foot jumping course and third in the equitation class. This is the third time he has won the jumping contest with his horse Ranger.







## NECROLOGY

---

Dr. Jacob Albrechtsen, the world famous specialist on the sterility of farm animals, died at Copenhagen, Denmark, on September 11, 1921, at the age of 61. Before notice of his death reached this country, the recently appointed Committee on Membership of the A. V. M. A. had decided to recommend that Dr. Albrechtsen be extended an invitation to be our guest at the next annual convention in order to demonstrate his methods of diagnosing pregnancy and treating sterility, with the view of attracting a large attendance of practitioners.

Dr. Albrechtsen had suffered from a stroke of apoplexy some months ago and his death was due to a recurrence of this trouble. He entered the Danish Veterinary College at the age of 23 and graduated four years later. From the beginning he paid particular attention to the diseases of breeding animals and his books on sterility have been translated and published in several languages. His pleasing personality and his incessant endeavors to give practical demonstrations of his methods to those who visited him, made him beloved by all. It is to be regretted that the death of this leader among veterinarians prevents the consummation of the well-laid plans to give the veterinary practitioners of North America the opportunity of absorbing his inspiration and observing his technique, and as a result the livestock industry of the country is indirectly the loser.

---

Dr. Henry Prentiss Armsby, Director of the Institute of Animal Nutrition at the Pennsylvania State College, died October 19, at the age of sixty-eight years. Dr. Armsby was widely known throughout this country and Europe as one of the foremost exponents of research in the field of animal nutrition. As early as 1880 he published his *Manual of Cattle Feeding* which was the first treatise on that subject to appear in this country. It gave not only a summary of experiments and investigations in that field up to the time, but described the methods of investigation and supplied a stimulus which led to the rapid growth of experimentation in that line.

Dr. Armsby was born in Northbridge, Mass., September 21,

1853. He graduated from Worcester Polytechnic Institute, later receiving his Doctor of Philosophy degree from Yale University. For several years he was associated with the Connecticut Experiment Station as assistant chemist, and on the organization of a station in Wisconsin, he went there in charge of agricultural chemistry. When an experiment station was organized in Pennsylvania in 1887, he was called there as director, and was for many years also dean of the school of agriculture in Pennsylvania State College. His researches centered more and more around animal feeding, and in 1898 he entered into cooperation with the Bureau of Animal Industry of the U. S. Department of Agriculture, to conduct investigations in the fundamental principles of animal nutrition. This cooperation continued for about twenty-two years. The Department assisted the Pennsylvania Station in the building of a respiration calorimeter which was the first apparatus of its type for investigations with animals. A long series of investigations were carried out on the use of food by animals, considered especially from the standpoint of the income and outgo of energy, the conditions affecting the utilization of feeds, such as age and type of animal, amount and character of feed, environmental conditions, etc. The earlier experiments were made with cattle and later studies were made of the metabolism of the dairy cow.

In 1907 Dr. Armsby was relieved from the directorship of the Pennsylvania Station, at his request, in order that he might devote his whole time to this line of inquiry, and in that year an Institute of Animal Nutrition was established with him as director, in affiliation with the experiment station. This plan was continued to the time of his death.

Dr. Armsby published two other books which were made possible by his studies and his mature knowledge of the subject, namely, *The Principles of Animal Nutrition*, in 1903, and *The Nutrition of Farm Animals*, in 1917. He had been honored by many institutions, receiving the degree of Doctor of Laws from the University of Wisconsin in 1904, and the honorary degree of Doctor of Science from Yale University and Worcester Polytechnic Institute in 1920 and 1921, respectively. He was a member of the National Academy of Science, the Royal Society of Arts of Great Britain, and foreign member of the Royal Academy of Agriculture of Sweden. He was sent to Europe by the







U. S. Government near the close of the war, as a member of the Inter-Allied Scientific Food Commission.

---

Dr. Jacob Helmer, of Scranton, Pa., a veterinarian of national reputation, died on October 31, 1921, at the age of 62 years.

The doctor had not been in the best of health for the past few months. Returning from New York city, where he went to consult a specialist, he was taken ill while on the train. Mrs. Helmer was with him at the time. The doctor collapsed when he reached his home and his condition grew gradually worse until the end.

Jacob Helmer was of Hanoverian German parentage, the son of Henry and Christiana Helmer. He was born August 26, 1859, at Brandt, Susquehanna county, Pa., and in boyhood studied in common and graded schools at that place and also at Lanesboro and Jackson, finally pursuing for two years a classical and scientific course at the State Normal School at Oswego, N. Y.

After being a teacher in the public school four years, he became a commercial traveler. In 1885 he entered the Veterinary College in New York, now a part of New York University. Completing his course he began the practice of his profession in Susquehanna, Pa. Six months later he removed to Scranton, where he has lived in continuous practice save the time he returned to the University of New York to study. In March, 1894, he was graduated with the degree of Doctor of Veterinary Surgery.

In 1891, Dr. Helmer became veterinarian to the Delaware, Lackawanna and Western Railroad Company, which position he held until his death.

For fourteen years he was a member of the State Board of Veterinary Medical Examiners. He was a member of the Pennsylvania State Veterinary Medical Association, an ex-president and its secretary for two years. He was a member of the American Veterinary Medical Association and secretary of the division of associated faculties and examining boards for North America for two terms.

He was a member in high standing of the Masonic fraternity, the Benevolent and Protective Order of Elks and other orders.

His genial manner and his happy greeting in daily life will be missed by his many friends.

Dr. Nelson T. Gunn, of Butte, Mont., died suddenly November 28, of heart failure. Dr. Gunn was District Deputy State Veterinarian for the Butte district, and was one of the most highly respected and best known members of the profession in Montana. He was 41 years old, and had spent most of his life in Butte. He graduated from the Butte High School in 1897, and later studied medicine two years in Leland Stanford University. For a number of years he was connected with the City Health Office in Butte. In 1915 he graduated from the San Francisco Veterinary College and started practice in Butte. He entered the service of the B. A. I. the same year, and was in the Meat Inspection Service at South Omaha for about a year. In 1916 he again took up practice in Butte, and in 1917 was appointed District Deputy State Veterinarian, in which position he served with remarkable success until his death.

Dr. Gunn was a member of the American Veterinary Medical Association and of the Montana Veterinary Medical Association. He was President of the Montana Association in 1918, and Secretary in 1920. In 1920 he was appointed on the State Board of Veterinary Examiners, of which he was secretary at the time of his death.

Dr. Gunn's success in the State livestock sanitary work was due both to his personality and his professional ability, and was such that his place will be very difficult to fill.

---

### GERMAN EFFORT TO REGAIN DRUG MARKET

According to the *Munchener Medizinische Wochenschrift*, the firm of E. Merck, of Darmstadt, has had a motion-picture film prepared for use in advertising in foreign countries the German chemical and pharmaceutical industry. Beginning with the raw material and leading up to the finished product ready for shipment, the manufacture of the most important drugs is shown, also the methods of producing therapeutic serums, with a glimpse of the inclosure in which the animals are kept. The film is in five reels and requires an hour and a half for its exhibition. It is evident that an effort is to be made by the German industry to regain the foreign markets which it held so largely before the war.





## MISCELLANEOUS

### FARM HORSES RAISE CASH

Ready cash being about as scarce as the proverbial hen's teeth, many a farmer in the Central West is casting about to find something to sell that will bring a substantial return. Horses have a cash value nearer normal than any other farm products, even though sold at sacrifice,—as they are, in many cases, with prices much lower than should be obtained. Men who are hard pressed for money are selling horses at \$75 to \$100 per head that other men in the same neighborhood, less crowded financially, would not sell for less than \$150 to \$175.

According to the farm calendar, the next considerable income will not be realized until after the first of the year. The sale of wheat, oats and such 1920 corn as farmers had carried over, only served to reduce their indebtedness at the banks. The majority have no cash crop yet to sell until the 1921 corn crop is harvested. This will be marketed as grain or through hogs. The cash from it will not be available generally until after January 1st. In the meantime winter clothing coal and other necessities must be bought.

Thousands of farmers are therefore selling off good work horses which they can ill afford to spare and which must be replaced before next spring. After the corn and hog crop goes to market, they will replace the teams which are being sold now with cheaper horses, buying either young horses or grade western stuff. These young or western horses will be broken in during February or March for next season's work, but will be less fit for heavy service than the work horses now being sold. It means that many farmers will need to use six horses on implements in 1922 where only four or five were used in 1920 or 1921.

### EFFECT ON HORSE PRODUCTION

This dispersion of farm stock and the shortage of good young horses in the country is certain to cause a startling jump in prices as soon as the tide turns. In many sections, the situation is anticipated by a great increase in breeding, such as reported by Hammer Brothers at Cooperstown, N. D., who, with three sires available, bred 150 mares this season as compared with 40 last year. It is important, at the turn of the tide, that breeding





be directed to desirable, efficient types. This is of double import at such a time, for when the general trend swings toward horse breeding, in order to supply the necessary numbers, it is easy to lose sight of the fact that just plain "hosses" aren't wanted any more; that, to bring profit, the horse must be particularly efficient for the work he is to do.

The fact that farmers have been able to realize cash in time of great need, on the sale of some of their horses, emphasizes the sound economic position good horses and mules occupy in farm management. These men who have been pulled out of the hole by a timely sale of one or two work teams, will not forget what pulled them. Farm sentiment is setting strongly toward increased horse use and production, for present conditions convince even the skeptical that horses and mules are the "one best bet" for farm work. The sacrifice of good teams to the markets now will ultimately benefit all, for increased horse use in cities widens future markets for horses, hay and grains. If there's any one thing the farmer wants most it's a wider and better outlet for staple farm products.

WAYNE DINSMORE.

---

### HUNGRY DUCKS

A new story is going around the financial district about an old southern negro who was asked by the proprietor of a store how he happened to need credit when he'd such a good cotton crop.

"De ducts got 'bout all dat cotton, sah," was the mournful reply.

"What do you mean the ducks got it?"

"Well, you see," explained the old man, "I sent dat cotton up to Memphis an' dey deducts the freight, an' dey deducts the storage charges, an' dey deducts the commission, an' dey deducts the taxes—yes, sah, de ducts got 'bout all dat cotton, an' dat's why I'm here."—*Selected.*

---

Dr. Seymour Hadwen, who has been connected for the past eighteen months with the reindeer investigations of the United States Biological Survey, at Unalakleet, Alaska, has arrived in Washington, D. C., with an abundance of scientific material, as a result of his studies.

Dr. Hadwen will spend the winter months getting his various lines of investigation in shape for early publication.

The National Veterinary Medical Association of Great Britain has had an exceptionally good year under the presidency of Dr. O. Charnock Bradley, who was re-elected for another year at the recent annual meeting. During the last year the membership increased from 372 to 1,115.

---

Dr. V. W. Woolen has recently purchased the practice of Dr. B. C. Hunt at Chebanse, Illinois, and has moved from Auburn to Chebanse. Dr. Hunt is now giving his entire time to control work of infectious diseases for the State of Illinois.

---

On November 22, 1921, Dr. Charles E. Cotton, of Minneapolis, was elected a director in the Minnesota Public Health Association, in appreciation of the excellent services he has been rendering his State as secretary of the Livestock Sanitary Board.

---

Dr. N. Nakamura of the Imperial Institute for Infectious Animal Diseases, Tokyo, Japan, is visiting this country with the view of studying our system and methods of organization. He will also spend some time in the Bureau of Animal Industry laboratories at Washington, D. C.

---

Dr. Cayetano López, official representative of the Bureau of Animal Industry of Spain, arrived in New York early in November and has been visiting the Lederle Antitoxin Laboratories at Pearl River, N. Y., the H. K. Mulford Laboratories at Glenolden, Pa., as well as those of the Bureau of Animal Industry in Washington. Dr. Lopez will remain in this country for several months, after which he will return to Spain and establish a national laboratory for the study of animal diseases and the preparation of biologics.

---

Dr. Carlos Pavia, Chief of the Veterinary Laboratories of the Department of Agriculture of Mexico, was a recent visitor at the Secretary's office.

Dr. Pavia brought a letter of introduction from Dr. Santa Maria who joined the A. V. M. A. at the recent meeting in Denver.

Dr. Pavia wrote out an application for membership in the A. V. M. A. and promised to use his best efforts to secure a number of members from our sister republic on the south.